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Alphabetical List of

NEW PRODUCTS

Developed Since November, 1944

DYESTUFFS AND PIGMENTS • TEXTILE CHEMICALS • EQUIPMENT

WITH the cooperation of the manufacturers of dyestuffs, textile chemicals, and wet processing and laboratory equipment, we have prepared the accompanying list of products which, it is understood, have been placed on the market or further developed since November, 1944. The list of products has been subdivided according to the classification mentioned and the individual products are listed in alphabetical order. The name of the manufacturer, in an abbreviated form, appears in capital letters immediately following the name of the product. In many cases the abbreviated name of the manufacturer will immediately indicate to the reader the full name of the company. However, supplementing and appearing below, we have listed alphabetically the key name of the manufacturer together with the complete firm name and address.

We have tried to make this list as complete and accurate as possible but there may be some unintentional omissions or errors. If so, we shall be pleased to have such matters called to our attention immediately. We have depended upon the manufacturers to supply us with a complete list of their new products together with information concerning them. The properties claimed for the products are those of the manufacturers. It must be understood, in this connection, that the information we have published is necessarily in brief form inasmuch as lack of space prohibits the publication of complete details concerning any product. We hope, however, that the information as it appears is sufficiently comprehensive to give the reader a specific idea of the properties and intended uses of the product.

KEY TO MANUFACTURERS' NAMES

ALROSE—Alrose Chemical Co., 180 Mill Street, Cranston, R. I.
ALTHOUSE—Althouse Chemical Co., Reading, Pa.
AMALGAMATED—Amalgamated Chemical Corp., Rorer & Ontario Sts., Philadelphia 34, Pa.
ANALYTE—Analyte Instruments, Inc., 1450 Broadway, New York 18, N. Y.
ARIDYE—Aridye Corp., Fair Lawn, N. J.
ARKANSAS—Arkansas Co., Inc., P. O. Box 210, Newark, N. J.
ARNOLD-HOFFMAN—Arnold, Hoffman & Co., Providence 1, R. I.
ATCO—Atlantic Chemical Co., Centredale, R. I.
BICK—Bick & Co., Inc., Reading, Pa.
BRISTOL—The Bristol Co., Waterbury 91, Conn.
BRYANT—Bryant Chemical Corp., 6 North Street, North Quincy 71, Mass.
CALCO—Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J.
CARBIC—Carbic Color & Chemical Co., Inc., 451 Washington St., New York 13, N. Y.
CARBIDE AND CARBON—Carbide and Carbon Chemicals Corp., 30 East 42nd St., New York, N. Y.
CARLSTADT—Carlstadt Chemical Co., Carlstadt, N. J.
CIBA—Ciba Co., Inc., 627 Greenwich St., New York 14, N. Y.
COMMONWEALTH—Commonwealth Color & Chemical Co., Nevins, Butler & Baltic Sts., Brooklyn, N. Y.
CONTINENTAL—Continental Chemical Co., 86 Lexington Ave., Passaic, N. J.
CYANAMID—American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York 20, N. Y.
DEXTER—Dexter Chemical Corp., 819 Edgewater Road, New York, N. Y.
DUPONT—E. I. duPont de Nemours & Co., Inc., Wilmington, Del.
EASTMAN—Tennessee Eastman Corp., 10 East 40th St., New York 16, N. Y.
G-E—General Electric Co., Special Products Division, Schenectady, N. Y.
GENERAL—General Dyestuff Corp., 435 Hudson Street, New York 14, N. Y.
GLYCO—Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N. Y.
HART—Hart Products Corp., 1440 Broadway, New York 18, N. Y.
HERCULES—Hercules Powder Co., Wilmington, Del.
HOUGHTON—E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.
HUNGERFORD—Hungerford & Terry, Inc., Clayton, N. J.
KMC—Kearny Manufacturing Co., Inc., Kearny, N. J.
MAAS & WALDSTEIN—Maas & Waldstein Co., 438 Riverside Ave., Newark 4, N. J.
MACBETH—Macbeth Corp., 227 West 17th St., New York 11, N. Y.
MAHER—Maher Color & Chemical Co., 355 West Ontario St., Chicago 10, Ill.
NATIONAL—National Aniline Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
NATIONAL STARCH—National Starch Products, Inc., 270 Madison Ave., New York 16, N. Y.
NAYLEE—Naylee Chemical Co., 8001 Frankford Ave., Philadelphia 36, Pa.

NOPCO—National Oil Products Co., Inc., First & Essex Sts., Harrison, N. J.
NUODEX—Nuodex Products Co., Inc., Elizabeth F, N. J.
NYANZA—Nyanza Color & Chemical Co., Inc., 215 Water St., New York, N. Y.
ONYX—Onyx Oil & Chemical Co., 15 Exchange Place, Jersey City 2, N. J.
PAISLEY—Paisley Products, Inc., 630 West 51st St., New York.
PHARMA—Pharma Chemical Corp., 175 Fifth Ave., New York 10, N. Y.
PRECISION—Precision Scientific Co., 1750 N. Springfield Ave., Chicago 47, Ill.
PROCTOR & SCHWARTZ—Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia, Pa.
QUAKER—Quaker Chemical Products Corp., Conshohocken, Pa.
RESIN, A. C.—Textile Resin Department, American Cyanamid Co., Bound Brook, N. J.
RICHMOND—Richmond Oil, Soap and Chemical Co., Inc., 1041 Frankford Ave., Philadelphia 25, Pa.
ROHM AND HAAS—Rohm & Haas Company, Washington Square, Philadelphia 5, Pa.
SANDOZ—Sandoz Chemical Works, Inc., 61 Van Dam Street, New York 13, N. Y.
SONNEBORN—L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.
SOUTHERN DYESTUFF—Southern Dyestuff Corp., P. O. Box 1045, Charlotte, N. C.
SPECIALTY—Specialty Products Co., Jersey City, N. J.
STANDARD—Standard Chemical Products, Inc., Hoboken, N. J.
SYLVANIA—Sylvania Industrial Corp., 122 East 42nd St., New York 17, N. Y.
SYNTHETIC—Synthetic Chemicals, Inc., 335 Boulevard, Paterson 3, N. J.
TAYLOR—W. A. Taylor & Co., 7300 York Road, Baltimore 4, Md.
ULTRA—Ultra Chemical Works, Inc., Paterson, N. J.
VICTOR—Victor Chemical Works, 141 West Jackson Blvd., Chicago 4, Ill.
VITA-VAR—Vita-Var Corp., Newark, N. J.
WARWICK—Warwick Chemical Co., West Warwick, R. I.
WATSON-PARK—Watson-Park Co., 261 Franklin Street, Boston, Mass.
WILBUR & WILLIAMS—Wilbur & Williams Co., Park Square Bldg., Boston 16, Mass.

DYESTUFFS and PIGMENTS

A

Algol Orange RFA Suprafix—(GENERAL)—said to be an excellent printing color widely used for application printing on cotton and discharge printing on rayon. Said to possess good fastness to light and very good fastness to washing and chlorine.

Aridye VX Colors*—(ARIDYE)—Aridye Pigment Colors of the VX Series are specially formulated for use in printing vinyl film or sheeting. They can be applied either by machine or screen method. For roller printing Aridye VX Colors are employed in conjunction with Aridye Clear 6452; for screen printing, in conjunction with Aridye Clear 6451-1. To prepare Aridye VX Colors for printing, they are hand stirred into the Clear. The cut of color to Clear depends on the shade desired; for heavy shades, a cut of 1 part of color to 2 parts of Clear is recommended. After printing, the vinyl film or sheeting is air dried. Aridye VX Colors are available in a wide range of shades including white, reds, scarlet, green, brown, violet, blue, yellows, orange, and black.

* Registered U. S. Pat. Off.

Azoanthrene Brilliant Red Z*—(ALTHOUSE)—a new bright shade of red for cotton and rayon said to have excellent fastness to washing, perspiration and cold water. It discharges white with hydrosulfite and leaves acetate fibers clear. It is extremely level dyeing and is applicable on all types of dyeing machines.

* Registered Trade-mark.

B

Benzo Rhodulinc Red BA Conc. CF—(GENERAL)—a direct dyestuff which produces bright shades of red and pink. It is said to dye very level, have good solubility, exhaust at a medium to rapid rate and is well dischargeable. The fastness to light is poor to moderate on cotton and moderate on rayon. Otherwise it has the moderate wet fastness of direct colors.

Benzo Violet O High Conc.—(GENERAL)—a straight direct dyestuff of high tinctorial strength which produces blue violet shades. It can be diazotized and when developed with Developer AMS or beta naphtol deep navy blue shades are obtained. Is applicable wherever direct colors are used, on cotton, rayon and other vegetable fibers in their various forms. In its fastness properties, when used as a direct color is not distinguished from the ordinary direct dyestuffs. However, when diazotized and developed, the wet fastness is considerably improved. The product is well dischargeable.

Bixamine Fast Blue FFGL—(BICK)—a fast to light direct blue said to possess excellent solubility and level dyeing properties. It is resistant to the influence of metals. While Bixamine Fast Blue FFGL is recommended for dyeing of cotton and rayon, it is also of interest in the dyeing of mixed goods in which the animal fibers are to be left clear. Hydrosulfite produces a white discharge.

Brilliant Benzo Green BA-CF—(GENERAL)—a homegeneous direct dyestuff; comes in a non-dusting form. It is sufficiently free from copper and manganese to be suitable for rubberizing. The affinity is good and the rate of exhaust medium. The solubility is better than 2 ozs. per gallon. On mixed material, consisting of rayon or cotton and wool, the animal fiber is dyed more heavily than the vegetable fiber when dyeing is carried out at or near the boil.

C

Calcochrome Alizarine Gray 2BLS—(CALCO)—an improved wool dye said to possess superior fastness to light and water spotting. For use in the production of seasonal gray shades and as a shading color for buffs, tans and taupes. Recommended by the manufacturers for automotive and upholstery fabrics because of high degree of fastness to light and water spotting. Equally suitable in union, acid or chrome formulations for apparel fabrics. When applied from a neutral bath, its superior exhaustion properties give greater color value than normally obtained.

Calcodur Violet 4RL—(CALCO)—a new addition to the Calcodur series of direct colors said to be of superior light fastness. Used to produce red shade violets on both cotton and rayon.

Calcofast Wool Blue 2G—(CALCO)—a very bright green blue metallized azo dye said to be of extremely good level dyeing properties. Uses include ladies' dress goods, men's wear, bathing suits, athletic wear and oriental rugs and carpets.

Calcofast Wool Bordeaux RB Conc. (Patent No. 2,366,633)—(CALCO)—a new metallized azo color said to be outstanding among the bordeaux and clarets in brightness, light fastness and fastness to sea water and sea water spotting. Gives excellent color value when used alone and as a base for reds, cardinals, crimson, maroons and bordeaux. In addition to normal uses, it is of particular interest for steamship and airplane fabrics, seashore carpets, upholstery, beach apparel and bathing suits.

Calcosol Brown BR—(CALCO)—an anthraquinone vat color producing chocolate brown shades said to possess excellent fastness properties. Fastness to

light and weather is said to be outstanding. Maintains its shade well in artificial light and is claimed to be superior to other types of vat browns in this respect. It exhibits good level dyeing properties and builds up well. It is recommended by the manufacturers for any purpose that calls for excellent fastness and is recommended for sport shirts, slacks, smocks, work clothing, etc.

Calcosol Gray 2G Double Paste (Patent Applied For)—(CALCO)—a new anthraquinone vat dye equally suitable for piece or package dyeing. This color is said to possess exceptional fastness to light, chlorine and water spotting and has outstanding level dyeing properties. It is useful not only as a base for grays, but also as an excellent shading color for blues, greens and mode shades.

Celludye P & K Pigments Colors—(DEXTER)—these pigment colors are designed for printing and dyeing operations in conjunction with Kopan and other alkali-cellulose media. Celludye P & K Pigment colors are adjusted for rapid miscibility and even dispersion. The wide range of Celludye P & K colors combine brilliance of shade with depth of hue. They are said to show excellent resistance to fading and heat sublimation. Wash and perspiration fastness of these colors is claimed to be superior to the usual types of pigments when used in alkali-cellulose solutions.

Celludye X Pigment Colors—(DEXTER)—Celludye X colors are especially designed for printing and dyeing operations where starches, gums, water soluble resins and similar media are used. They are adjusted for rapid miscibility and even dispersion. The wide range of X pigment colors combine brilliance of shade with depth of hue. They are said to show excellent resistance to fading and heat sublimation. Wash and perspiration fastness of these colors is said to be excellent when used with the proper types of binders.

Chlorantine Fast Brown 6GLL and 2RLL—(CIBA)—straight color browns said to possess superior light fastness both before and after crease-proof finishing with urea formaldehyde resin. Both of these colors are said to have excellent dyeing and leveling properties. Both reserve acetate rayon but are not dischargeable.

Chromanthrene Yellow LL—(ALTHOUSE)—a new chrome yellow for wool which is said to have excellent fastness to light and fulling. It is claimed to be far superior in light fastness to the usual offerings of chrome yellows. It has good solubility, dyes level and is applicable by any of the conventional chrome methods for dyeing. It may be used in combination with other chrome dyes for the dyeing of compound shades.

Coprantine Yellow GG; Coprantine Yellow 3RLL; Coprantine Red RLL; Coprantine Pure Blue 2GLL—(CIBA)—new colors in this series of direct dyestuffs for dyeing cotton, rayon and staple fiber in shades fast to light, water and washing. A simple direct dyeing is followed by after-treatment, rinsing and soaping. Although not dischargeable to a pure white, they should be of interest for plain shade dyeing where improved light and wash fastness is desired.

D

Diagen Yellow AY; Diagen* Yellow A2Y*—(DU PONT)—two new yellows recently added to the line of Du Pont Diagen colors for printing cotton. These colors are stabilized azoic types, the Diagen Yellow AY yielding reddish shades and the Diagen Yellow A2Y greenish shades of yellow. It is stated that both products are readily soluble, possess good fastness to washing and have good stability in printing pastes. They are particularly recommended by the manufacturer for the production of bright shades of yellow and for a range of browns in combination with other Diagen colors.

* Registered Trade-mark.

Diamine Brown MB A-CF—(GENERAL)—a straight direct dye which produces very reddish shades of brown. It is said to level fairly well, have fairly good solubility, exhaust at a medium to rapid rate and give a good discharge. Is not distinguished over other direct colors in fastness properties. When speck dyed, the affinity is fairly good and the animal fiber is left fairly clean.

Dipyrazo Bordeaux NR—(PHARMA)—a new developed Bordeaux somewhat yellower and brighter than Dipyrazo Bordeaux 2BL. Intended especially for rayon. It is said to give good wash fastness, light fastness, and white discharge. Acetate effects are left white. The product is said to have excellent perspiration and salt water fastness.

Dipyrazo Orange BRS—(PHARMA)—a new type on the order of Dipyrazo Orange RS. This type is slightly yellower and brighter in shade said to possess good washing, light, perspiration and salt water fastness. The BRS type leaves Celanese effects white. This type can be dyed in the presence of strong concentrations of soda ash.

E

Eastman Fast Yellow 4RLF—(EASTMAN)—said to have exceptional fastness to sunlight and, of the fast-to-light acetate yellows, is claimed to be one of the fastest with respect to washing and perspiration. A direct acetate dyestuff, it dyes over a temperature range of 160° to 190° F. It is highly recommended by the manufacturers for the dyeing of drapery and other fabrics which require extreme fastness to light and gas fading. Because of its high resistance to sublimation, it is also recommended for application printing.

F

Fast Red Salt G G—(GENERAL)—a fast color salt which when coupled with various naphtols of the Naphtol AS range produces a variety of shades including red, rust, brown and black. The solubility and wetting out properties are good and the stability in the print paste is satisfactory.

Fast Scarlet Salt G G N—(GENERAL)—is said to be one of the most versatile developers producing useful shades with nearly all the Naphtol AS products with very good fastness to light and good to very good fastness to washing and chlorine. Some of the combinations are well dischargeable.

I

Indanthrene Dark Blue BP Paste Fine—(GENERAL)—in printing and dyeing produces bloomy shades of navy blue with a greenish cast, greener and brighter than the shades obtained with the well known Indanthrene Dark Blue BOD. It can be printed on cotton or rayon with excellent results. In dyeing it is applicable to cotton in its various forms as well as on rayon yarn and piece goods, linen and other vegetable fibers. The product is well adapted for application according to the pigment padding process.

Indigosol Bordeaux 12RN—(CARBIC)—gives mode Bordeaux shades said to be of very good fastness to light, washing and chlorine.

Indigosol Printing Violet IRRN—(CARBIC)—is said to be of good fastness to light, washing and chlorine.

Indigosol Red I2B—(CARBIC)—gives bright red and pink shades said to be of very good fastness to light, washing and chlorine.

Indigosol Yellow GC—(CARBIC)—a bright canary yellow said to be of very good fastness to washing and chlorine and of moderate fastness to light, suitable for producing bright greens in combination with Indigosol Green.

K

Katigen Tan R Conc. CF—(GENERAL)—a sulfur color which possesses fairly good fastness to light which is improved by a chrome and bluestone after-treatment; although the shade is changed much redder and duller, the wet fastness and fastness to cross dyeing is satisfactory. Because of its good leveling property and good solubility, it is suitable for use in jig and pressure machine dyeing.

N

National Acid Dark Green A Conc.—(NATIONAL)—said to possess excellent solubility and high resistance to metals. In medium percentages it forms an ideal basis for the production of Hunter Green, Myrtle and Olive shades, while in full dyeings, it yields greenish blacks. It is said to possess good fastness to light, very good fastness to steaming and excellent fastness to water and to carbonizing.

National Alphazurine FGND Conc.—(NATIONAL)—this is National Alphazurine FG conc in non-dusting form, a feature welcomed by the pigment industry where this color is widely used for the production of Peacock Blue lakes.

National Carbanthrene Grey MBM Paste—(NATIONAL)—dyed on cotton or rayon, by either the pad jig or reduced bath method, this product yields reddish gray shades said to possess good fastness to washing, rubbing, hot pressing and mercerizing and very good fastness to light and perspiration. Applicable in all types of machines.

National Carbanthrene Khaki 2GPF Paste — (NATIONAL) — particularly suitable for application to cotton yarn, by the pigment method, in circulating types of machines. Said to possess generally excellent fastness.

National Naphthol AS-E—(NATIONAL)—on textiles this product yields shades similar to Naphthol AS-BS but somewhat faster to light. Said to be extremely valuable in the pigment industry for producing a wide range of bluish red and maroon toners that have greater resistance to bleeding in solvents than the ordinary para red and toluidine toners.

National Niagara Blue 5B—(NATIONAL)—a new direct blue said to possess a very bright shade, excellent solubility and good resistance to metals. It is level dyeing, well adapted for application at low temperatures, leaves acetate rayon unstained and discharges well with hydrosulfite. Said to possess excellent fastness to acids and water spotting and very good fastness to rubbing.

National Superchrome Yellow GRN—(NATIONAL) — this product is said to possess good solubility, level well and can be applied to wool by the top chrome, bottom chrome or metachrome methods. It is said to possess excellent fastness to light, washing, perspiration, steaming and hot pressing. It is particularly valuable for coloring yarn and piece goods.

Nuprint (Patented) — (MAAS & WALDSTEIN)—dispersed pigment colors for textile printing and coloring by means of screen, roller or padding. When used with Nuprint Neutral for color control, it is applicable to cottons, rayons and other fabrics. They are said to be fast to light, washing and dry cleaning. When ready for application Nuprint Colors are an oil in water emulsion, therefore rollers and equipment can be readily washed with cold water.

Nyasol Fast Red BBS—(NYANZA)—a new addition to the group of Nyasol fast colors producing a bright bluish red said to be of excellent fastness to light, washing and perspiration. It is dyed in a strongly acid bath and has excellent levelling properties. It is suitable for dyeing woolen and worsted piece goods, worsted yarns, etc.

Nyasol Fast Yellow EL—(NYANZA)—a new addition to the group of Nyasol Fast colors producing a bright greenish shade of yellow when dyed in a strongly acid bath. It is said to have excellent fastness to light, washing and perspiration and works well in combination with the other Nyasol Fast colors.

Nyasol Navy Blue RN—(NYANZA)—a new addition to the group of Nyasol Fast colors producing a bright shade of navy blue when dyed in a strongly acid bath. It is said to have excellent fastness to light, washing and perspiration and is suitable for dyeing woolen piece goods, worsted yarns, etc.

P

Palatine Fast Navy Blue 3 RL Conc. CF—(GENERAL)—is a new addition to the series of Palatine Fast colors. Like the other brands, it is a chromiferous acid dyestuff which produces shades having fastness properties approaching those of chrome colors, in a simple acid dyeing operation. The product is practically unaffected by metals as usually encountered in dyeing apparatus except aluminum which causes a loss in depth.

Pharmanil Brilliant Red 3B—(PHARMA)—a brilliant and very bluish red for wool. Exhausts well from an acetic acid bath. Cotton, rayon and Celanese effects are left white, while silk is dyed. The light, salt water and perspiration fastness are said to be very good. A light milling and fulling test shows excellent properties. This product can be printed on rayon and silk.

Pharmanil Red RB — (PHARMA) — a brilliant bluish red. Exhausts well from an acetic acid bath. Cotton, rayon and Celanese effects are left white, while silk is dyed. The light fastness, salt water and perspiration fastness are said to be very good. A light milling and fulling test shows excellent properties. The product can be printed on rayon and silk.

Pharmasol Blue G — (PHARMA) — a stabilized solution of an azoic color for printing cotton, linen, and rayon. A bright navy blue said to possess excellent wash and chlorine fastness, and good light fastness.

Pharmasol Brown 2G—(PHARMA)—a stabilized solution of an azoic color for printing cotton, linen, and rayon. A full yellowish brown shade said to possess fair light fastness, and excellent wash and chlorine fastness.

Pharmasol Brown R — (PHARMA) — a stabilized solution of an azoic color for printing cotton, linen, and rayon. A full reddish brown shade. Said to possess good light fastness, and excellent wash and chlorine fastness.

Pharmasol Seal Brown — (PHARMA) —a stabilized solution of an azoic color for printing cotton, linen, and rayon. A very dark full shade of seal brown. Said to possess good light fastness, and excellent wash and chlorine fastness.

Pontachrome Fast Gray L Conc.*—(du PONT)—the latest addition to the range of Du Pont chrome colors for wool. It is stated that it should find wide use because of its outstanding light fastness. It is recommended by the manufacturers primarily for stock and piece dyed automotive fabrics, piece dyed grays for men's wear, and similar uses that require superior light fastness in pale shades. The color is sufficiently fast to moderate fulling and may be dyed satisfactorily by any of the usual chrome methods. It is an excellent color for shading the wool component of unions when dyed in a neutral bath.

* Registered Trade-mark.

Pontacyl Dark Green G Conc. 175 Per Cent*—(du PONT)—this new addition to the line of Du Pont acid colors for wool is recommended by the manufacturers for the economical production of the yellower shades of dark green and for shading blues and blacks. It has the same generally good working qualities and fastness properties of Pontacyl Dark Green B Conc.

* Registered Trade-mark.

Pyrazol Fast Blue FLL—(SANDOZ)—a new blue reported to have outstanding fastness to light. Another feature is its stability to urea formaldehyde and maintainance of good light fastness after this treatment. It is said to be very stable to heat. It has very little affinity for wool which coupled with its extreme light fastness should make it very valuable for union dyed automobile and upholstery fabrics.

Pyrazoline Blue CF—(PHARMA)—a bright greenish blue direct dye. When dyed on rayon, the product is unaffected by urea formaldehyde crease proofing. The product is said to have excellent light fastness. The salt water and perspiration fastness are said to be excellent. Acetate effects are left white. Good discharge in light shades.

Pyrazoline Blue 2RCF—(PHARMA)—a direct dye similar to Pyrazoline Blue CF, however, a considerably redder, fuller shade. Like the CF type, it has excellent light fastness, which is unaffected by urea formaldehyde resin proofing. The perspiration and salt water fastness are said to be excellent. This product has good discharge properties.

Pyrazoline Orange LR—(PHARMA)—a bright direct orange. This product is said to have excellent light fastness, good wash fastness, and give a white neutral discharge with a slightly creamy alkaline discharge on rayon. On cotton both discharges are perfectly white. The product leaves acetate effects slightly stained. The perspiration and salt water fastness are said to be excellent.

R

Rapidogen Brown G G N—(GENERAL)—an azoic preparation soluble in caustic soda which, after printing and acid ageing develops in the form of an insoluble dyestuff said to possess superior wet fastness properties. It is applied in the conventional manner for Rapidogens. Is of very good solubility and stability in the print paste and fixes completely in acid ageing.

Rapidogen Red I T R—(GENERAL)—said to be a very valuable product which, when printed in the usual manner for Rapidogens on cotton or rayon, produces bright bluish reds and pinks of very good fastness to light and washing and good fastness to hot pressing and over-printing with caustic soda. It possesses good solubility when dissolved with the requisite amount of alkali, producing print pastes with good stability. It develops in acid ageing within three to five minutes.

Rapidogen Blue B N—(GENERAL)—an azoic preparation soluble in caustic soda which after printing and acid ageing develops in the form of an insoluble pigment said to possess good wet fastness. When printed on cotton or rayon fabrics it produces bright blue shades with good fastness to washing, fairly good fastness to light and to chlorine.

S

So-Dye-Sul Liquid Blue MGCF—(SOUTHERN DYESTUFF)—a liquid, ready-to-dye, bright greenish blue shade, said to possess unusual level dyeing and non-oxidizing properties. As a result of these outstanding dyeing characteristics, it is especially well suited for dyeing packages, beams, and piece goods. The general fastness properties are claimed to be superior to the conventional type of sulfur colors.

So-Dye-Sul Navy G2BCF Paste; So-Dye-Sul Royal M Paste; So-Dye-Sul Royal MRCF Paste; So-Dye-Sul Blue 6RCF Paste; So-Dye-Sul Red Brown 9R Paste; So-Dye-Sul Brown NCF Paste; So-Dye-Sul Brown FCF Paste; So-Dye-Sul Green YG Paste; So-Dye-Sul Olive Yellow DCF Paste; So-Dye-Sul Black PCF Paste—(SOUTHERN DYESTUFF)—a line of unreduced, finely dispersed, sulfur color pastes, which have been developed primarily for pigment padding. These are subsequently reduced on jigs or continuous machines. These colors are especially adapted for recently developed continuous machine equipment. When reduced with Sodium Hydrosulfite and Caustic, brighter shades and improved fastness are obtained with the navies and blues.

Sulfogene Carbon RCF Grains (Pat.)*—(DU PONT)—a new sulfur black which is a copper controlled type yielding redder shades than Sulfogene Carbon Supra CF Grains. Like other sulfur blacks made in granular form, Sulfogene Carbon RCF Grains (Pat.) is non-dusting and wets out readily. This product is characterized by improved exhaustion and oxidation on the fiber. It is said to exhibit good light fastness in the lower strengths and excellent light fastness in full shades. Other fastness properties are similar to Sulfogene Carbon Supra CF Grains.

* Registered Trade-mark.

Sulfogene Navy Blue 7R Supra CF*—(DU PONT)—a new copper controlled sulfur blue of exceptional redness and brightness. It is designed to provide a base color for the economical production of dark blues and navies which may be shaded with a sulfur black and is also recommended for bright medium blues with a distinct reddish tone. This color exhibits similar working properties and the same good general fastness to the usual color destroying agencies as the somewhat greener Sulfogene Navy Blue 4RCF.

* Registered Trade-mark.

TEXTILE CHEMICALS

A

Aeroset Resin—(registered trade mark)—(RESIN, AC—a product applied to woven rayon and acetate fabrics and mixtures to retard gas fading and to stabilize the fabric against shrinking, stretching, and slipping. Aeroset also provides a wrinkle resistant finish. Use of chlorine in washing process should be avoided.

Alrochlor B H (Patent Pending)—(ALROSE)—an agent used in the chlorination of wool which leaves wool white and prevents degradation of the wool. Non-felting characteristics and stabilization of the fabric are said to be produced.

Alrosept—(ALROSE)—A germicidal surface-active agent of the quaternary ammonium type. Used where fungicidal, germicidal, and wetting properties are desired. Phenol coefficient on staph. aureus at 20°C. not less than 250. Used in textile finishing and proprietary cosmetic compounds. Exhibits rust inhibiting properties when combined with mineral oil.

Algepon V A—(ARKANSAS)—a dye retardant and offered especially for use as an assistant in stripping vat colors. It is added directly to the usual Hydrosulfite-Caustic Soda reducing bath. The reduced color is held in the leuco state thereby permitting removal from the cloth through rinsing and producing optimum stripping results.

Alkamerce—(HART)—claimed to be the ideal mercerizing penetrant. Said to completely eliminate boil-out or wet-out, with attendant savings in labor, steam and chemicals. Will not lose its wetting power on standing nor form any scum in the caustic. Easily washed out of the goods. Has a low exhaustion rate and a low solvent effect on cotton waxes and pectins. It is said to ensure an increased "degree

of mercerization," greater strength, more uniformity and an increased luster on the goods.

Alkamine K-50—(AMALGAMATED)—a sulfated fatty amide wetting agent and detergent in liquid form for scouring and dyeing cotton, rayon and nylon.

Alkamine Powder—(AMALGAMATED)—a powdered sulfated fatty amide for one bath scouring and dyeing rayon and nylon.

Amidex—(HART)—a liquid amide-type wetting and scouring agent. Miscible with cold water and not affected by alkalis, acids, salts or hard water. It is especially recommended by the manufacturers as a dyeing, leveling and dispersing agent.

Ammonyx—(ONYX)—liquid cationic finishing agents, easily soluble in water, which may be employed either alone or in conjunction with certain types of synthetic resins, dullers, etc., to produce combination effects on cotton and rayon goods. Recommended by the manufacturers especially for after-treatment of direct dye prints for dye fixing in order to prevent mark-off. Softening agents.

Anti Fume A—(CONTINENTAL)—an inhibitor against gas fading for acetate rayons, substantially increasing the resistance of acetate blues to gas fading. Said to impart excellent hand to the fabric.

Anti-Gas Finish AG—(ULTRA)—protects changing of shades of acetate fabrics caused by gas-fading, resulting from atmospheric fumes, and steaming. Extremely simple application at solution temperatures of from 100 to 110° F.

Aquanon—(MAHER)—a stable wax emulsion containing aluminum salts used to produce water repellency on all fibers.

Aquarol N S P—(ARKANSAS)—a durable type water repellent that is offered for processing all types of fabrics. A very pleasing soft, full durable finish is said to be obtained by a simple application. No special machinery or high curing temperatures are necessary. Ordinary mill equipment and normal drying temperatures may be used with complete satisfaction.

Atcosoft No. 440—(ATCO)—cation active softening and finishing agent. Provides a durable finish said to possess excellent resistance to laundering and dry cleaning.

B

Binder No. 40—(CIBA)—a water emulsion of melamine resin which is used as a binder in pigment dyeing and printing. It also finds application for durable finishes such as dull finish and slip-proof finish.

Brytex Filasize AN—(BRYANT)—a protein base warp size for filament yarns. Deposits a tough but pliable size film that is said to ensure high weaving efficiencies. Penetrates well. Runs very clean on looms and slashers. Is particularly well adapted for use on high sley constructions. Maximum economy.

Brytexol N-7—(BRYANT)—a neutral non-foaming penetrant and rewetting oil. May be used in both acid and alkaline solutions. Particularly recommended by the manufacturers where a minimum of foam is of paramount importance.

Butyl Stearate—(ARNOLD-HOFFMAN)—$C_{17}H_{35}COOC_4H_9$. Mol. wt., 341, Sp. gr., .85-.86 at 20/20°C. M. P. 19.5°C. Flash point 358°F. Low Volatility. Plasticizer for ethyl cellulose, cellulose nitrate, polystyrene, polyvinyl butyral and polyvinyl chloride. Should be of interest in protective coatings and as plasticizer in wax finishes.

1, 3-*Butylene Glycol*—(CARBIDE AND CARBON)—$CH_3CHOH\text{-}CH_2CH_2OH$—a high-boiling, water-soluble dihydric alcohol with a useful combination of humectant and solubility characteristics. These properties fit it for use as a softening agent for textile fibers and as a mutual solvent for textile compounds, printing pastes and dyes. Its capacity to attract and retain water exceeds that of glycerol.

C

Carabond 50—(CARLSTADT)—a slip proof finish composed of a blend of natural resins. Said to be effective even in low concentrations in reducing to a minimum, slippage, pulling apart of seams and fraying. Imparts a soft, full hand. Compatible with most finishing softeners, dullers, etc.

Caramine 200—(CARLSTADT)—a cationic softener that leaves cottons, rayons and acetates with a soft suede finish. Soluble even in cold water. Cream colored paste. Color setting properties.

Caraplex Rosin No. 5—(CARLSTADT)—a urea formaldehyde condensate, in cream form, used to impart a permanent resin finish to fabrics. It acts as an anti-creasing and anti-slip agent. This resin has been found to be unusually stable even after long storage.

Caraplex Resin No. 50—(CARLSTADT)—a syrup type urea formaldehyde condensate, used to control shrinkage of rayons, acetate and cotton fabrics. Said to impart a full hand to the goods, which is permanent.

Carapol Powder—(CARLSTADT)—a synthetic organic detergent in powder form manufactured from Carapol Detergent. Fine white powder which does not cake on standing. Free flowing even after storage in a humid atmosphere.

Carapol Detergent—(CARLSTADT)—a synthetic organic detergent of the modified sulfonated fatty amide type that is said to afford excellent money value for wetting, dispersing and detergent purposes. Excellent results are said to be obtained when used as scouring and dyeing assistant. Effective under extreme hard water, acid or alkaline conditions. Outstanding all around detergent. Neutral.

Carboxymethocel A and S—(CIBA)—these are respectively, the aluminum and sodium salts of carboxymethylcellulose (cellulose glycollic acid). They are said to be excellent thickeners which can be employed in textile printing as well as for paints, sizings, coatings and emulsions.

Carlsope—(CARLSTADT)—a soap, partly synthetic, manufactured from low titer fats. Said to possess solvent like action, free rinsing nature and not affected by acids and hard water as are ordinary soaps.

Carolite 400—(CARLSTADT)—a condensation type of synthetic organic detergent claimed to possess excellent dispersing and levelling properties. Amber colored oil. Salt free. In addition to being an effective scouring and dyeing assistant, this product leaves the fibers soft.

Ceglin (Patented)—(SYLVANIA)—Medium C and Soft C—durable cellulose finishes for rayons and cottons. Used to impart fullness and mellowness to these fabrics either alone or blended with the H type Ceglins.

Cellosize Hydroxyethyl Cellulose WS* 1000—(CARBIDE AND CARBON)—a new high-viscosity grade of hydroxyethyl cellulose with a viscosity range of 900 to 1,100 centipoises; a water-soluble protective colloid and film-forming material that is an excellent carrier for the pigments and colors in dyestuff pastes for textile printing. This thickening agent increases the solubility of the dyestuff in the printing vehicle. Particularly attractive in screen printing pastes, its advantages are said to include excellent penetration or "strike," sharpness of pattern, and ease of removal. The treated fabric is left with a good hand, and there is no bleeding of the colors into the non-printed cloth. In roll-printing pastes it can be used to advantage when good definition of line is desired, or with dyes that are unstable with starches.

* Registered Trade-mark.

Clear 6214—(ARIDYE)—all-purpose clear for use in preparation of pigmented water-in-oil emulsions for printing dress goods and other fabrics. Clear 6214 permits

plissé effects to be obtained with the regular line of Aridye* Pigment Colors. It is said to have: excellent stability during storage and on running; excellent flowing properties permitting close control of viscosity; and excellent stability to hydrosulfite used in discharge printing. Clear 6214 may be used on naphtholated grounds. Its lack of color and its high transparency insure the full brilliancy of pigment colors.

* Registered U. S. Pat. Off.

Clear 6451-1—(ARIDYE)—a specially formulated clear for use in screen printing on vinyl film or sheeting with Aridye* Pigment Colors of the VX Series.

* Registered U. S. Pat. Off.

Clear 6452 — (ARIDYE) — a specially formulated clear for use in machine printing on vinyl film or sheeting with Aridye* Pigment Colors of the VX Series.

* Registered U. S. Pat. Off.

Clear-flo—(NATIONAL STARCH)—a new type of modified starch, recommended particularly by the manufacturers for Sanforized finishes on cotton fabrics.

Some of the properties claimed for Clear-flo are:

1. It is said to gelatinize to a clear, colorless, transparent solution that will not dull the luster of mercerized fabrics nor alter the shades of printed or dyed materials.

2. It is said to be entirely non-congealing even at high concentrations and consequently will penetrate readily into the yarns—without leaving a surface deposition or "smear" on the fabric to cause "sticking" troubles on the Sanforizer.

3. It is said to be compatible with the customary oils and softeners used for Sanforized finishes, and to have excellent "wetting back" properties, which will not hinder the "shrinking in" operation.

4. It is stated that textile plants finishing shirtings, dress goods, and work clothes will welcome *Clear-flo* for soft mellow finishes, crisp linen effects or for a firm, full-bodied hand.

Concoset C — (CONTINENTAL) — a modified urea formaldehyde finish for cottons and rayons, imparting shrinkage and crease proofing.

D

Decresol 1861 — (CYANAMID) — a durable cationic softener suitable for cottons, rayons and all types of synthetics. Said to product a soft, supple, greaseless finish which will not turn yellow or become rancid upon storage. Effective at very low concentrations.

Definized Process for Rayons (Patent Pending)—(ALROSE)—applied to rayons this process is said to enable definite stabilization of the fabric to be attained without the use of resin. Textile equipment is utilized which is normally on hand in a finishing plant to apply treatment.

Definized Process for Wool (Patent Pending) — (ALROSE) — application of this process to woven wool fabrics—definite stabilization is said to be effected in a simple wet process.

Deoxyvat — (MAHER) — a stabilizing medium to hold vat colors in reduction so that full color value and uniformity can be obtained. Vats of different dyeing temperatures can be more easily dyed together with this aid.

Derramine — (WATSON-PARK) — Uses: softener and finish for woolens, worsteds, cotton, and synthetic fabrics. Reduces the number of runs on nappers. Used in union dyebaths for handle.

Detanol P.—(COMMONWEALTH)—a non-ionic wetting and emulsifying agent. Stable in acid, alkaline or salt solutions. (calcium, magnesium, aluminum, etc.). Either liquid or powder form.

Detergent D—(CIBA)—a cream colored powder. One per cent solutions of this material show a pH of 7.7. It is said to have good detergent properties in soft and hard water. It can be used in conjunction with alkali, which improves its effectiveness.

Detergol—(ULTRA)—a detergent and wetting out agent, used primarily in dyeing process. Permits boiling off and dyeing of rayon, cotton and rayon, rayon and acetate fabrics in single operation. Contains powerful solvents which are said to assure complete removal of all waxy and fatty substances. Also assures level dyeing and dispersing. Other uses: boiling off synthetic fibers, cleaning backgrays, presoaking to loosen mineral oil, wax or fat. Low price permits use for every type of fabric.

Detersol—(ALROSE)—a sulfated type of detergent which exhibits a marked improvement in detergent action in salt solution. Used in textile scouring baths.

Developer Base R P N—(GENERAL)—an organic alkali representing a clear, slightly viscous, nearly colorless liquid with a pungent odor. It can be used in place of caustic soda for dissolving Rapidogen colors whereby Rapidogen prints can be developed in neutral ageing, whereas with caustic soda acid ageing is required. In this manner, it becomes possible to print Rapidogens alongside vat colors and to develop them by a passage through a vat ager. When printing Rapidogens with Developer Base RPN alongside vat colors an addition of Developer Assistant RPN should be made to counteract contamination with fixed alkali or reducing agent, carried over from vat color print pastes, which will interfere with proper development. Suitable Rapidogens applied by the Developer Base RPN method develop completely in five minutes vat ageing and do not vary in their fastness properties from prints obtained in the conventional way with caustic soda and acid ageing.

2,3-Dichlorpropanol-1 (Glycerol Dichlorhydrin)—(CARBIDE AND CARBON) $CH_2ClCHClCH_2OH$—a medium-boiling liquid, partly soluble in water. The compound is of greatest interest as a chemical intermediate, taking advantage of the three functional groups as points of reactivity. Dichlorpropanol may be used as a chemical means of putting together hydrophilic and hydrophobic groups to form new compounds of value as textile assistants, detergents, and finishing agents.

Dullite CS — (ULTRA) — a delustrant for underwear, flat fabrics, etc.

Dur-Lana (Patented)—(WARWICK)—an aqueous dispersion of a synthetic resin being used in the treatment of woolen and worsted textiles to impart resistance to shrinkage during laundering. Dur-Lana is substantive toward animal fibers and can therefore be applied in a long bath in the same manner as a dyeing process. No curing or special handling is required.

Dynesol (AMALGAMATED)—a sulfonated naphthalene and benzene ester for wetting and dyeing of cotton, rayon and nylon.

Dypenol SED — (DEXTER) — a new member of the Dypenol series of mercerizing assistants. Dypenol SED is added directly to the mercerizing caustic and preliminary boiling-out of the yarn or fabric may be eliminated. The use of this assistant is said to permit higher mercerizing speeds without decrease in degree of mercerization. Dypenol SED is said to have a high degree of wetting speed and does not lose its power through exhaustion onto the goods or on standing in the caustic. There is no foaming in the recovery of caustic containing Dypenol SED. Recommended for caustics from 48° Tw. to 58° Tw.

E

Emulsifier Base N G S—(ARKANSAS)—a neutral product that is recommended by the manufacturer for blending with all types of mineral, vegetable and animal oils to produce self-emulsifying fiber lubricants.

Eprotex Paste — (CARLSTADT) — a synthetic detergent and synthetic softener used in the boil-off and dyebath of rayons and acetates to impart full bodied softness of a durable nature. Said to give the fabric or yarn a good bottom for dyeing. Said to be effective even under acid, alkaline or hard water conditions. Can be used in

those finishing baths where cationic softeners would precipitate.

Eprotex Softener—(CARLSTADT)—a cationic softener, said to afford outstanding money value. White paste, readily dispersible in warm water. Imparts a soft, dry hand. Recommended by the manufacturers for yarn, woven and knitted fabrics, and hosiery.

Eternalure DB — (ONYX) — a resin emulsion for nylon hosiery. A finish that is said to impart a durable dulling effect with good body.

Ethoxytriglycol — (CARBIDE AND CARBON) — $C_2H_5O(C_2H_4O)_3C_2H_4OH$ — high-boiling solvent for dyes and a mutual solvent in textile oil specialties. A colorless, mild-odored liquid, completely soluble in water, which retains many of the excellent solvent characteristics of the lower glycol-ethers.

F

Fen—(AMALGAMATED)—a one bath water repellent finish for cotton, rayon and nylon fabrics.

Fen Aseptic—(AMALGAMATED)—a one bath water repellent and anti-mildew compound.

Filaseal R — (AMALGAMATED) — a resin and water repellent finish for one bath treatment of hosiery of rayon, nylon or silk.

Finish A-50—(CIBA)—an anionic softener in paste form. It is compatible with other anionic materials such as soaps and sulfonated oils. It is especially recommended by the manufacturers for the finishing of synthetic fabrics.

Formaset 10—(WARWICK)—a modified urea formaldehyde condensate being used for shrinkage control finishes on cotton and rayon finishes.

Fybrol 1115 & 1115*L* (*Patent Applied For*) — (SONNEBORN) — self-scouring wool and worsted lubricants. Permit fulling and scouring without soap.

G

Glycaid—(GLYCO)—dye assistant and levelling agent for various textiles. The use of Glycaid with direct, vat, diazo, and acetate colors, in various applications is said to produce exceptional levelling of shade. Glycaid is claimed to be outstanding among levelling agents in that it gives excellent exhaustion of the dye-bath with consequent economy of dyestuff.

H

Hartexsize NLN—(HART)—a combination of synthetic waxes and resins in solvent solution for treating nylon yarn in throwing operations for hosiery knitting. Application is simple and requires neither special equipment, nor unusual operations.

*Hexyl "Carbitol"**—(CARBIDE AND CARBON) — $C_6H_{13}OC_2H_4OC_2H_4OH$ — mutual solvent and coupling agent in textile processing compounds and detergent compositions. A colorless liquid of mild odor that boils at about 252° C.

* Registered Trade-mark.

*Hyamine 3258**—(ROHM AND HAAS)—a one bath mildewproofing agent for textiles. It is water soluble and substantive to cellulose. After application it is said to be fast to leaching with running water at room temperature. This fungicide is said to impart excellent protection against both mildew growth and soil burial deterioration. It contains no metallic constituent and in use is for all practical purposes colorless, odorless and a non-irritant. Hyamine 3258 can be applied from water in standard textile processing equipment and can also be incorporated in organic systems.

* Registered U. S. Pat. Off.

I

Igepon T Powder — (GENERAL) — a synthetic surface active agent said to possess the good properties of soap without its drawbacks, while its action is many times more effective. It is stated that it is a very powerful detergent, stable to hard water, acids and alkalis under any conditions met with in textile processing.

Intracol & Intracol OA & O—(SYNTHETIC)—a softening, emulsifying, and finishing agent. Chemical nature: Long chain fatty acid amide containing multiple amino groups.

Intral A. E.—(SYNTHETIC)—a wetting agent; mercerizing assistant and stabilizing agent. Chemical nature: Long chain aliphatic amine.

Intrals 224-229-384—(SYNTHETIC)—a wetting agent; dispersing agent; emulsifier. Chemical nature: Long chain fatty acid ester containing multiple ether linkages.

Intramines — (SYNTHETIC) — Uses: detergent, wetting; wool scouring, emulsifying; dye assistant, bleaching assistant, dispersing, fulling; conditioner. Chemical nature: sodium salt of sulfonated lauryl and myristyl collamide U.S.P. 1,981,792.

J

Janusol — (SYNTHETIC) — Use: Dispersing, emulsifying, wetting, (anionic & cationic). Chemical nature: Mixture of lauryl and myristyl esters containing both primary amino and sulfated groups.

K

Kopan 47 Powder (Patented)—(DEXTER)—a specially prepared cellulose for making Kopan 47 cellulose solutions. The powder is instantaneously soluble in solvent C.A.C. (catalytically activated caustic) at 30°-40° F. A 5 per cent solution of Kopan 47 Powder in solvent C.A.C. has a viscosity of 150 C.P. at 75° F. These solutions are recommended by the manufacturers for permanent finishes on rayon as well as for shrinkage control. These solutions are also used in the combination vat-dyeing and permanent finishing process for rayons.

Kopan 60 Powder (Patented)—(DEXTER)—a specially prepared cellulose for making Kopan 60 cellulose solutions. The powder is instantaneously soluble in solvent C.A.C. (catalytically activated caustic) at 30°-40° F. A 5 per cent solution of Kopan 60 powder in solvent C.A.C. has a viscosity of 1200 C.P. at 75° F. These solutions are recommended by the manufacturer for the production of permanent finishes on cotton as well as for shrinkage control.

Kopan 100 Powder (Patented)—(DEXTER)—a specially prepared cellulose for making Kopan 100 cellulose solutions. The powder is instantaneously soluble in solvent C.A.C. (catalytically activated caustic) at 30°-40° F. A 5 per cent solution of Kopan 100 powder in solvent C.A.C. has a viscosity of 3000 C.P. at 75° F. These solutions are recommended by the manufacturer for the production of a stiff permanent finish on cotton and the finish is said to be highly resistant to washing and dry-cleaning.

L

Lacet Resin (Registered Trade Mark)—(RESIN, AC)—a product applied to cotton or rayon Nottingham lace curtains during pigment dyeing and/or finishing as a durable stiffener to prevent stretching (sagging) and shrinking. Lacet is said to contribute to soil resistance and eliminate need of framing and ironing. Lacet Resin can be used to bind pigment colors thus producing improved light fast fabrics. Use of chlorine in washing process should be avoided.

*Lanaset Resin** *(Registered Trade Mark)*—(RESIN, AC)—a product applied to woven and knitted fabrics after dyeing and as part of the finishing process, for the control of wool shrinkage and felting. Wool treated with Lanaset resin can be hand washed according to instructions set forth on hang tags.

* The process under which it is applied is covered by U. S. re-issue Patent No. 22,566.

Leonil O Solution—(GENERAL)—a textile auxiliary which is offered especially as an assistant for use in the processing and dyeing of wool and similar fibers. An outstanding property is said to be its strong dispersive power, which is exercised even in the face of such strong coagulating influences as the calcium and magnesium ions to hard water, or hydrogen ions in dilute acid solution, or chrome or sulfate ions from the salts used in dyeing wool. It is stated that only by comparative tests in the laboratory followed by trial in mill dyeing can the superiority of Leonil O Solution for dispersing lime soap over other products offered for this purpose be appreciated.

Leophen—(GENERAL)—an auxiliary used as an assistant in mercerizing. It should be added directly to the caustic soda solution. If the caustic solution is made from solid or flake caustic it should be cooled to the temperature at which it is to be used before adding the Leophen. No preliminary preparation, such as warming, etc. is required with Leophen. When using Leophen it is never necessary to use caustic soda solutions stronger than 48° Tw. (22 per cent). Mercerizing liquors containing Leophen will give satisfactory mercerization at caustic concentrations as low as 40° Tw.

Leveltex—(MAHER)—a levelling and dispersing agent for dyeing direct and acetate colors of poor solubility and levelling properties.

Liquid Alkamine—(AMALGAMATED)—an amine condensation product for wetting, scouring and dyeing of all types of fabrics.

Lytonate—(SONNEBORN)—wetting, rewetting and dispersing agent. Levelling agent for naphthol dyeing.

M

Marcanol L—(MAHER)—an alkylarylsulfonate in concentrated liquid form. Easy to handle and dissolve. Said to be completely resistant to lime, magnesium and iron salts. Stable in acid or alkali. Useful as a detergent, wetting agent, dye levelling and wool scouring agent.

Marcanon—(MAHER)—An anionic softening agent for all types of materials. An aliphatic amine condensate stable in storage, and unaffected by water variations during application. Also useful as a plasticizer for synthetic resin finishes.

Marcaton C, R, and W—(MAHER)—cation-active agents for softening cottons, rayons, and wool. Stable white pastes which do not discolor whites and have a minimum effect on colors.

Marco Retarder S—(MAHER)—a highly purified lignon sulfonate product used to retard the rate of exhaust in vat dyeing to promote penetration.

Marco Vatol P—(MAHER)—a solubilizing and dispersing product for vat colors used to apply vats in pigment form to be reduced on the fiber. Useful for dyeing light shades level.

Marcomin Powder—(MAHER)—an alkylaminosulfate synthetic detergent, said to be ideal for boiling off rayons, acetates, and other synthetic yarns, piece goods, and hosiery. Gives a rich suds in hard or soft water.

Melantine FN—(CIBA)—a water soluble melamine resin which finds application for shrinkage control and crush resistance. It can also be used for the fixation of direct and acid colors.

Melantine SS—(CIBA)—a solvent solution of melamine resin which is used as a binder and for water resistant coatings.

Mercerol GS—(SANDOZ)—a mercerizing assistant of very high concentration. Especially suitable in piece mercerizing and also applicable in yarn and warp mercerizing. It is said to be extremely fast in its wetting action although only very small quantities are required. Of interest for production of maximum luster, maximum dye affinity, and for increasing production. Compounded petroleum fractions.

Methyl Cellosolve Stearate—(ARNOLD-HOFFMAN)—$C_{17}H_{35}COOCH_2CH_2OCH_3$. Mol. wt., 342. Sp. gr., .888 at 25/25° C. M. P., 22-24° C. Flash point 378° C. Low volatility, excellent heat stability. Plasticizer for cellulose acetate butyrate, cellulose nitrate and waxes. Should be of interest in wax finishes and protective coatings.

Mulsor—(SYNTHETIC)—Use: Emulsifying. Chemical nature: Long chain fatty acid ester of polyglycol.

N

Napterge and Napterge Assistant—(MAHER)—synthetic scour and phosphate complex to replace soap and soda ash in the boiling off of naphthol dyeings. Stable in hard water or acid. Said to solubilize and disperse any loose naphthol pigment, resulting in cleaner, brighter dyeings, faster to washing and crocking.

"Naybasol"—(NAYLEE)—a liquid wetting agent said to possess great penetration, detergency and foaming. Especially recommended by the manufacturers for kier bath and dye operations.

Negamine—(SYNTHETIC)—Use: Finishing, softening, lubricant, dispersing, wetting and emulsifying. Chemical Nature: Amino ester of the long chain fatty acids.

Nekal A E M A—(GENERAL)—an emulsifying, dispersing and wetting agent particularly suitable for the emulsification of mineral oils, fatty oils and waxes also for the dispersion of pigments. It is a combination of a protective colloid and a sulfonated organic compound on the order of alkyl naphthalene sodium sulfonate. It, therefore, contains a surface active agent with strong emulsifying and dispersing action with a colloid to stabilize emulsions or dispersions formed.

Neol—(CARLSTADT)—a synthetic organic detergent non-ionic in nature. Can be used in conjunction with both anion and cation active products. Recommended by the manufacturers as a wetting and dispersing agent in highly alkaline baths, bleaches, vat printing pastes, etc. Salt free.

Neonaphtol—(MAHER)—a colloidal levelling agent for naphthol prepares. Said to assure level dyeings when using naphthol combinations of different substantivity. Also said to increase penetration on coarse cotton yarns, heavy piece goods, and in package dyeing. Highly dispersive.

Neutronyx—(ONYX)—a group of non-ionic surface active agents of unusual stability in the presence of electrolytes. They are said to possess wetting, penetrating, and foaming properties useful, for instance, in the acid or neutral scouring of wool and in the chlorination of wool for shrink-proofing. Specific compounds are available which are tailor-made for detergency, wetting, or emulsification of mineral and vegetable oils.

Nonisol—(ALROSE)—a water soluble, non-ionic wetting agent, stable in dilute organic acids and mild alkaline solutions. Heat stable, it is said to possess good detergent properties in concentrated salt solutions. As a wetting agent it does not exhaust during wet processing of textile fabrics. Said to be an excellent emulsifier in hard and saline solutions. Has excellent rewetting properties and is recommended by the manufacturers as a Sanforizing assistant.

*Nopco** 1056-*X* (*Re.* 21,530)—(NOPCO)—new coning oil, which has been designed specifically for nylon hosiery yarn. An anti-static, friction minimizing oil, Nopco 1056-X is said to have excellent physical and chemical stability.

* Registered U. S. Pat. Off.

*Nopco** 1179-*R* (*Re.* 21,536)—(NOPCO)—synthetic detergent for textile scouring and dyeing—particularly effective for the scouring of raw wool, woolen and worsted yarn, top and piece goods; cotton and rayon piece goods; and for the scouring and fulling of woolen felts. Nopco 1179-R scoured or fulled fabrics are said to have a notably soft hand. Void of inorganic salts, Nopco 1179-R has shown especial merit in the dyeing of hosiery as an aid in maintaining a slow exhaustion of

the dye bath thus insuring level dyeing.

* Registered U. S. Pat. Off.

Norane S (Patented)—(WARWICK)—a quaternary ammonium compound of the same type as Norane. This product is used where exceptionally soft finishes are desired. Norane S-treated textiles are said to meet all government and civilian requirements for durability against laundering and dry cleaning.

*Nuocides**—(NUODEX)—a complete line of fungicides designed for the textile trade. These products will mildewproof or rotproof fabrics, and some in the development stage, are non-toxic, colorless, odorless compounds with a wide variety of applications for the textile industry.

* Registered U. S. Pat. Off.

Nylon Finish No. 1370—(COMMONWEALTH)—a compounded latex finish said to give increased wearing qualities and snag resistance, as well as a pleasing hand and dullness.

Nylon Finish No. 1371—(COMMONWEALTH)—a compounded resin finish said to give increased wearing qualities and snag resistance, as well as a pleasing hand and dullness.

Nyltex No. 172—(RICHMOND)—a new product for the knitting of nylon. It is used in a trough in water solution. Its function is to keep needles clean, to prevent the nylon from sticking, to prevent the formation of size spots all over the machine, and to keep even tension during knitting. It also keeps the machine clean.

O

Onyxsan GT—(ONYX)—a cationic material. Light yellow paste. Soluble in water. 1 per cent solution has a pH of 7-8. Suggested uses: softening agent for textiles giving a wash resistant (durable) effect, especially useful in hosiery, maintaining resilience. An emulsifying agent.

P

Paramul 115—(CYANAMID)—an emulsion of wax and aluminum salts. This non-durable water-repellent will yield a spray rating of 100, when properly applied to fabrics. This product contains approximately 38 per cent solids and is stable over long periods of storage.

Paramul 251-*A* (CYANAMID)—a very concentrated paraffin wax emulsion. Suitable for general finishing purposes as well as for use in making up a water-repellent in conjunction with aluminum salts, mildew preventives, etc.

Penetrant M-2 (Patented)—(KMC)—a mercerizing penetrant of high efficiency.

Pentrosulf—(MAHER)—an alkyl naphthalene sulfonate used for levelling wool and cotton dyeings and preventing foam spots on vat dyeings; also used as a penetrator for carbonizing in acid.

Pluramine S—(KMC)—a detergent said to possess good penetrating power. It is recommended by the manufacturers as scouring and finishing agent of cellulosic fabrics and as a rewetting agent for the Sanforizing process.

Pro-Nyl—(SPECIALTY)—a lubricant-size for nylon designed for single process solvent treatment. Said to impart all characteristics necessary for dry knitting.

Protex Gel EB—(CIBA)—a dyeing assistant and softener especially suitable for the dyeing of chrome leather.

Protex Gel Fl—(CIBA)—an anionic softener in paste form. Dissolves very readily in water. Is especially recommended by the manufacturers as a dispersing and softening agent which can be used in the dyebath.

Proton Process (Patent Pending)—(ALROSE)—Claimed to be the only aqueous method of chlorinating wool producing non-felting and shrinkproofing effects without altering or injuring the fiber in any way.

Pyrotex No. 121—(STANDARD)—a new neutral synthetic detergent said to possess excellent detergent and sudsing properties, easily rinsable and not affected by hard water, acid or alkali. This product is especially recommended by the manufacturers where neutral scouring and boiling off are required and is said to give a good, clear white bottom for whites, light and pastel shades. Adapted to acetate, rayon, nylon, wool and mixtures thereof.

Q

"Q E D" No. 2—(PAISLEY)—nylon throwing solvent treatment for single-end application over size rolls on winder or after twisting or on Universal coning equipment replacing both size and oil. "QED" No. 2 enables thrown nylon to be dry-knit.

"Q E D" No. 3-C—(PAISLEY)—French crepe throwing solvent treatment for cake soaking or single-end sizing with uniform penetration replacing both size and oil and containing no waxy substances.

"Q E D" No. 8—(*PAISLEY*)—Solvent warp size is run cold through size box and over cylinders at increased sizing speeds. Requires no de-sizing of fabric before dyeing or finishing. Will size any type synthetic yarn.

Quaker Dianol "G"—(QUAKER)—claimed to be an extremely efficient liquid combination synthetic detergent, emulsifying and wetting agent. It is stated that it dissolves instantly in cold water, has excellent sudsing power, is acid-stable and rinses out very easily. Suitable for use wherever a good detergent and/or wetting agent or kier assistant is required. Particularly effective for wool scouring.

Quaker Dianol No. 20—(QUAKER)—a sulfonated condensation product said to have excellent wetting, re-wetting and softening characteristics. Its wetting power is not only maintained but actually increased as temperatures are increased up to the boil. Dianol No. 20 is a red, amber colored clear oil which dissolves immediately in the coldest water. It is stated that it is highly versatile in that it demonstrates its powerful penetrating powers in both soft and hard water and in solutions containing alkali builders, dyes, Glauber's salt, common salt, soaps, emulsions and acids such as acetic, formic, etc. Its wetting speed (Draves Test) on an applied cost basis is claimed to be better than any competitive product which has been tested in the Quaker Laboratories. Concentrations of as little as 0.03 per cent to 0.06 per cent are said to be satisfactory for most textile applications. Product is said to show rewetting or wetting-back properties commensurate with its straight wetting-out properties. When dried into a fabric, Dianol No. 20 is not effected by temperatures prevalent on drying cans or tenter frames and shows a high degree of wetting-back or absorbent ability.

Quaker Dianol "R"—(QUAKER)—a synthetic detergent that is said to be extremely effective in high temperature scouring (from 140° F. to the boil). Available in paste form at present; it is stable both in acid and in alkali solutions and is especially effective when used with tetra-sodium pyrophosphate, soda ash and other alkaline builders. Suitable for use in scouring before dyeing; during bleaching; wetting, dyeing and printing; soaping after dyeing; and kier boiling.

Quatronyx D-40 A—(ONYX)—a non-cresylic type of mercerizing penetrant said to give very rapid action in extremely low concentrations. Effective in caustic soda solution within the range of 40° Tw. to 57° Tw.

R

Repel-O-Flame—(ONYX)—for imparting fire retardant characteristics to fabrics.

Resilex A R N—(PAISLEY)—water vehicle sizing with increased film strength and lubrication reducing static in weaving. Requires no desizing of woven goods be-

fore dyeing and finishing. Will size any type synthetic yarn.

Resin Dispersion C 101—(ONYX)—contains polyvinyl acetate as an aqueous dispersion of extremely fine particle size. Air drys to a clear, tough, colorless film and is recommended by the manufacturers for the impregnation of fibrous materials such as cotton, rayon, nylon, paper, and wood pulp. Product contains only resin, dispersing agent and water and presents no inflammability or toxicity hazards in use.

Resin Dispersion CB—(ONYX)—contains polymethyl acrylate and is free of solvents other than water and therefore presents no inflammability or toxicity hazards in use. Air drying gives a clear, colorless, flexible film. Recommended by the manufacturers for impregnation of cotton, rayon, nylon, paper, and wood pulp.

Resin Dispersion C-2B—(ONYX)—contains a vinyl-acrylic copolymer as an aqueous dispersion of extremely fine particle size. Air drys to a clear, colorless, tough, somewhat flexible film. Product contains only resin, dispersing agent and water and presents no inflammability or toxicity hazard in use. Recommended by the manufacturer for impregnation of cotton, rayon, nylon, paper and wood pulp.

Resin Dispersion CD-1—(ONYX)—contains polymethyl methacrylate and is free of solvents other than water and therefore presents no fire or toxicity hazards in use. Oven drying gives a clear, somewhat brittle film. Shows promise as a dulling agent for synthetic fibers and as an impregnating agent for special effects.

Resin Dispersion CD-2—(ONYX)—contains polystyrene and is free of solvents other than water and therefore presents no inflammability or toxicity hazards in use. Oven drying gives a clear, somewhat brittle film. Shows promise as a dulling agent for synthetic fibers and as an impregnating agent for special effects.

Resinette Process (Patent Pending)—(ALROSE)—a process of producing a urea—formaldehyde resin finish without the use of an inorganic catalyst or organic catalyst at the point of application on cotton or linen finishes. Tendering of the fiber is minimized.

Resipon B—(ARKANSAS)—a synthetic resin of urea formaldehyde composition in liquid form that is recommended by the manufacturers for finishing all types of textile fibers where a permanent finish or shrinkproof effect is desired.

Resipon D—(ARKANSAS)—a urea formaldehyde resin in powder form that is offered for use in the production of permanent or shrinkproof finishes.

Resodull P T—(ARKANSAS)—a synthetic resin derivative offered especially for finishing nylon hosiery. It is said to be a complete finish in itself and produces the necessary body, snag resistance and dullness without the use of any other agents.

Resynon NS*—(ARNOLD-HOFFMAN)—a water-soluble alkyl urea resin recommended by the manufacturers for shrinkage control on rayon and cotton. This resin is said to possess excellent stability and to have good wash resistance.

* Registered Trade-mark.

*RHoxyme DX**—(ROHM & HAAS)—a concentrated enzyme preparation for textile desizing with outstanding high temperature tolerance. It is supplied as a light colored powder possessing excellent storage stability. The use of the desizing solution at high temperatures gives more rapid penetration and complete starch conversion. A more uniform bottom is obtained in less time for increased efficiency of subsequent bleaching, dyeing and finishing operations.

* Registered U. S. Pat. Off.

S

Sandopan PO—(SANDOZ)—a detergent in powder form. Said to possess excellent stability to acid, alkali, and lime. Very effective at all temperatures. Useful on animal and vegetable fibers and also on synthetic fibers. An amino condensate.

Sandozol BR—(SANDOZ)—a leveling agent for acid colors and Celanese colors in powder form. Primarily active as a dispersing agent bringing about complete molecular dispersion of the dyestuff. A buffered amino condensate.

Scourclean X—(RICHMOND)—is one of the new synthetic detergents; said to be impervious to hard water, acids, alkalis, etc. It is used for scouring woolens and worsteds, both yarn and piece goods. It may be used in a bath that is slightly acid to brighten the shades, and clean the fiber. It may also be used in conjunction with soap for fulling or in scouring with acid for acid fulling.

Seravon—(AMALGAMATED)—a saponified fatty ester for scouring and dyeing of yarns and piece goods.

Sheerset Resin—(registered trade mark)—(RESIN, A C)—a product applied to cotton, rayon and acetate sheer, woven fabrics and mixtures as a wash resistant stiff finish, thus making fabrics hand washable. Sheerset is said to make possible the substantial binding of pigment colors, thus improving light fastness. Use of chlorine in washing process should be avoided.

Solvadine G—(CIBA)—a very efficient wetting out agent and detergent. It is said to be effective in hard as well as in soft water, and is especially recommended by the manufacturers for applications in which good wetting out properties as well as detergency are required.

Solvadine R—(CIBA)—an ether sulfate. It is said to be an exceptionally stable wetting and penetrating agent which is valuable wherever penetration is a problem.

Solvent C.A.C.—(DEXTER)—solvent C.A.C. is a specially prepared catalytically activated caustic for use in the preparation of cellulose solutions from Kopan Powders. The solvent is highly concentrated and is diluted considerably in the preparation of the cellulose solutions. Solvent C.A.C. is available in drums or tank cars.

Sprodco One—(SPECIALTY)—an anhydrous wax-like synthetic lubricant-size designed for soaking rayon cakes or skeins in solvent medium for weaving.

Sprodco 50—(SPECIALTY)—a knitting wax designed especially for treatment of rayon yarn. Applied in solvent at room temperature. Readily dispersible in water.

Sprodco 1492—(SPECIALTY)—a coning oil for nylon which is anhydrous, self-emulsifiable, and non-oxidizing.

Stabilizer B—(KMC)—a stabilizer for pigments used in printing and finishing.

Standafin No. 79—(STANDARD)—a permanent resin finish said to impart a full hand, slip-proof finish and having delustering effects. Recommended by the manufacturers for all types of cloth, both sheer and heavy and especially applicable for cloth such as linings and underwear.

Sulfanole R (Patented)—(WARWICK)—a long chain amino acid condensate being used as a detergent and protective colloid for scouring, dyeing and bleaching operations.

Sulframin DH Paste—(ULTRA)—alkylaminosulfate detergent. Slightly alkaline. Its pH is about 9. Recommended by the manufacturers for scouring, washing, desizing, etc., of all fabrics. Balancing of organic against inorganic detergent provides maximum efficiency.

Sulframin DHL Liquid—(ULTRA)—a powerful detergent which is particularly adaptable for the boiling off of quality rayon fabrics.

Sulframin DT Paste—(ULTRA)—alkylaminosulfate detergent. Said to be strictly neutral. Has pH of 7.5. Recommended by the manufacturers for scouring, cleansing, etc., where a detergent—even slightly alkaline—is to be avoided. Wetting qualities said to be somewhat higher than average.

Sulframin DT POWDER—(ULTRA)—an alkylaminosulfate classified as a synthetic detergent, utilized in almost every phase of textile boiling off and dyeing.

Recommended by the manufacturers as foaming and wetting agent, with excellent dispersing qualities. Particularly useful to dyers of acetate and acetate-mixed fabrics.

Claimed to be a powerful emulsifier in powder form — dissolves immediately in water; forms rich suds in dilutions of 1 to 10,000 parts of water. Totally immune to lime and magnesium salts; resists acids and alkalis. Does not deteriorate in storage.

Surfax L.X.—(HOUGHTON)—an economical surface active agent in soluble oil form, said to have fast wetting and rewetting properties. Used very successfully as a dye bath leveler and assistant for Sanforizing. Surfax L.X. is said to represent an excellent money value.

Syzon—(SONNEBORN)—solvent size treatment for knitting nylon hosiery yarns.

T

Tensols—(SYNTHETIC)—a kier assistant, dye assistant, bleaching assistant, carbonizing assistant, wetting agent, dispersing agent, emulsifying agent. Chemical nature: sulfonated naphthalene alkyl ether.

Terposol 3—(HERCULES)—is said to have a volatility practically identical with that of pine oil and to have good solvent and wetting properties. It has found growing application in textile chemicals as well as in rayon delustering. It is a light-colored, mobile liquid having a characteristic terpene-like odor, and is insoluble in water but soluble in and miscible with most organic solvents.

Terposol 8—(HERCULES)—a powerful solvent for resins and has distinct wetting properties for many types of surfaces. It is a viscous, light colored mobile liquid having a mild terpene-like odor and has a relatively high boiling point and evaporates slowly at room temperatures. It is slightly soluble in and miscible with most organic solvents.

Textiloc — (MAHER) — synthetic resin finish for rayon piece goods. Prevents slipping and creasing.

*Triton A-20**—(ROHM AND HAAS)—an entirely new type synthetic detergent which is said to be extremely effective even in concentrations as low as 1/10 of 1%. It is stated that the whiteness retention properties of this material are exceptional, making it highly effective for obtaining clearer shades of dyed goods and cleaner grounds in printed fabrics. It is recommended by the manufacturers primarily for soaping off colors after dyeing or printing. It is nonionic and has the outstanding stability of this type product even in the presence of electrolytes, acids and alkalies.

* Registered U. S. Pat. Off.

Trukon — (HART) — a highly efficient single bath water-repellent agent; very stable, readily soluble. Said to meet all government specifications for military fabrics. Said to be always uniform, dependable and economical to use.

U

"Ucon" Lubricants*—(CARBIDE AND CARBON)—of interest as general lubricants for textile fibers. These compounds are manufactured in two types, water-soluble and water-insoluble, and in a wide range of viscosities. Both types are non-gumming and non-corrosive and are characterized by excellent lubricating properties. Simple water rinsing of the water soluble type or a light scour on the water-insoluble type is said to permit easy removal of the lubricant with no undesirable residue on the fibers.

* Registered Trade-mark.

Ultra Sulpha Oil—(AMALGAMATED)—a sulfonated castor oil for dyeing and finishing of yarns and piece goods.

Ultramin B—(ULTRA)—a cationic active agent of polyamine-glyceride condensation used in finishing of acetates, rayons, spun rayons and various mixtures. Fabrics treated with Ultramin B are said to withstand consecutive launderings without loss of soft finish. Generally 10 minutes in a 90°F. bath after dyeing completes the process.

Ultramin 12—(ULTRA)—less expensive than Ultramin B, is said to be excellent for finishing of lower type fabrics. Resistance to alkalis and acids, though not absolute, is said to be sufficient to warrant its use in processing coarser fabrics such as flat goods, low priced hosiery, etc. Otherwise analogous to Ultramin B.

Ultrapole Soap Solution—(ULTRA)—a modified monopole soap solution for dyeing.

Ultrapone—(ULTRA)—a cationic active amido alcohol, having a pH of approximately 8; said to lend cleaning powers superior to straight naphtha solutions. Surface active in naphtha. Prime use: as an emulsifying agent for water-in-oil and oil-and-water emulsions. Recommended by the manufacturers for use as dry cleaning detergent.

Unitexol AC — (ULTRA) — highly sulfonated vegetable oil for the finishing of all types of quality fabrics.

V

Velubra Wax—(AMALGAMATED)—a cationic softening agent for softening of cotton and rayon.

Velvetol F.H.—(HOUGHTON)—a finishing material in paste form, for providing a full hand and satisfactory softness to cotton fabrics. Contains no stearic acid or free fatty acid; pH 7.5-8.0; will not oxidize nor produce odor in finished goods.

V.F. 15—(CARLSTADT)—a stiffening agent for cottons, rayons, acetates and nylons. A mixture of gums in readily dispersible form. Can be diluted with cold water. Compatible with dullers. Recommended by the manufacturers particularly for nets, veilings, marquisettes, etc.

Victamine D33—(VICTOR)—a cationic softener which is said to impart a distinctive soft feel to cotton and rayon. Easily applied from water dispersion.

Victawet 35B—(VICTOR)—a non-foaming, anionic wetting agent recommended by the manufacturers for any process where foam is undesirable. Works especially well in alkaline solutions. Improves application of vat dyes.

Victawet 58B—(VICTOR)—an anionic wetting agent, effective in reducing surface tension. Produces moderate amount of foam. Said to possess strong wetting action in hot or cold solutions.

Vita-Clor Finishes — (VITA-VAR) — new finishes developed for Army and Navy use, now available for civilian markets. For use on textiles, fabric, and paper; in all climates and under severe conditions. Once treated with Vita-Clor, materials are claimed to be flame resistant, weatherproof, and mildewproof for the life of the material. Vita-Clor is supplied in a clear finish and a pleasing range of colors. It can be applied by any of the standard finishing processes. Trademark registered.

W

Warcosol 60-S — (WARWICK) — an alkyl naphthalene sulfonate being used as an all-purpose wetting and penetrating agent for textile processing. Warcosol 60-S is effective over an extremely wide pH range.

Weighting Compound No. 1359—(COMMONWEALTH) — a compound for imparting weight and body without stiffness or harshness to dress goods. Used on rayon, cotton, wool, acetate either alone or with other finishing ingredients.

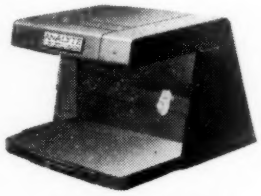
Z

"Zelan" AP Paste — (DU PONT) — "Zelan," Du Pont's durable repellent finish is now offered in a new and improved form. Called "Zelan" AP Paste, it is said to offer improved working qualities and greater durability, particularly in resistance to moisture absorption.

EQUIPMENT

Acid Causticbond — (WILBUR & WILLIAMS)—a new plasticized resin coating for controlling corrosion of tanks, equipment and floors in textile processing plants. It is said to resist the corrosive action of strong caustics and acids including oleic, sulfuric and bleaching solutions. This product has been field-tested for several years against strong caustics, and corrosive acid conditions and is now available in several colors, including very Light Gray and Ivory Tan. It is brush applied for air drying; specially formulated also for tank interiors and other submerged surfaces.

Analyte Comparator — (ANALYTE) — the new Analyte North Light Comparator for color matching. The following claims are made for this instrument: color matching is said to be stepped up to higher definitions than ever before obtained in color matching lamps; has both incandescent light and Analyte north light for contrast, said to give extraordinary color separations which reduce color matching errors to a minimum; the Analyte Comparator is said to be the nearest reproduction of north light in existence, according to well-known authorities; the analyte spectrum is said to be completely continuous, consisting of overlapping bands.

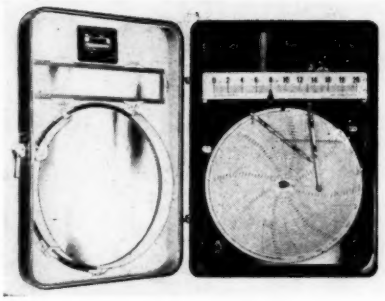


Analyte Comparator

Dr. Chauncey Starr in ascertaining the quality of Analyte in the Russell Sage Laboratory, Department of Electrical Engineering and Physics, Rensselaer Polytechnic Institute, reported: "This light may be considered the equivalent of north sky light. The spectrum is completely continuous, consisting of overlapping bands. As far as I am aware, no other non-incandescent source gives a spectrum that compares with this one for continuity and lack of peaks."

Current Input Controller—(BRISTOL)—a new electric type controller which combines a proportional current input controller and a recorder in one case. Designed to provide extremely accurate control of electrically heated furnaces and ovens, this new instrument provides on-and-off type control with the advantages of proportioning control.

A rotating cam interrupts the flow of current to the heating coil or coils the duration of which is determined by the departure of the controlled temperature from the control point.



Current Input Controller

Complete details are given in Bulletin PB1226.

Coagulator—(HUNGERFORD)—Bulletin G is a new bulletin illustrating and describing a high speed, high efficiency mixing and settling unit for use in connection with the coagulation and sedimentation of water.

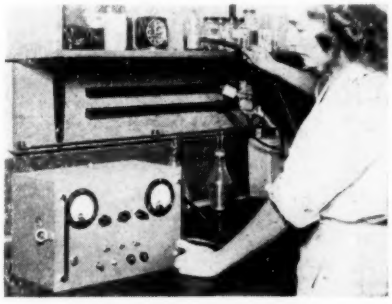
Edwards Exchanger — (HUNGERFORD) — Bulletin EE — a machine for producing de-ionized or de-mineralized water comparable in analysis with single distilled water.

Ferrosand Filter—(HUNGERFORD)—Bulletin FF—a pressure type iron and manganese removal filter for removing all of these harmful metalic impurities from well water supplies. Particularly suited to the textile industry.

Filters—(HUNGERFORD)—Bulletin PF: a new bulletin illustrating and describing pressure type mechanical sand clarifyfying filters for removing turbidity, color, iron, organic matters, etc., from surface or ground water supplies.

Mercury-Vapor Detector—(G-E)—a new electronic detector for instaneously detecting the presence of mercury-vapor concentrations in the atmosphere. The new detector is designed particularly for use in the glass, chemical, smelting, metal-mining, and electric apparatus manufacturing fields where mercury-vapor concentrations must be kept below the toxic limit—1.2 parts mercury vapor in 100,000,000 parts of air by volume, for continual breathing—to safeguard the health of employees. The detector will measure directly mercury-vapor concentrations as high as one part in three million parts of air by volume and as low as one part in two hundred million parts, with an accuracy of approximately 5 per cent. Set at its highest point of sensitivity, the detector is also capable of measuring with reasonable accuracy concentrations as low as one part in a billion. In addition, it will detect mercury if it is carried by a gaseous medium whose spectral absorption band does not overlie the 2537 Angstrom wave length.

G-E Mercury-Vapor Instantaneous Electronic Detector in Use in Laboratory.



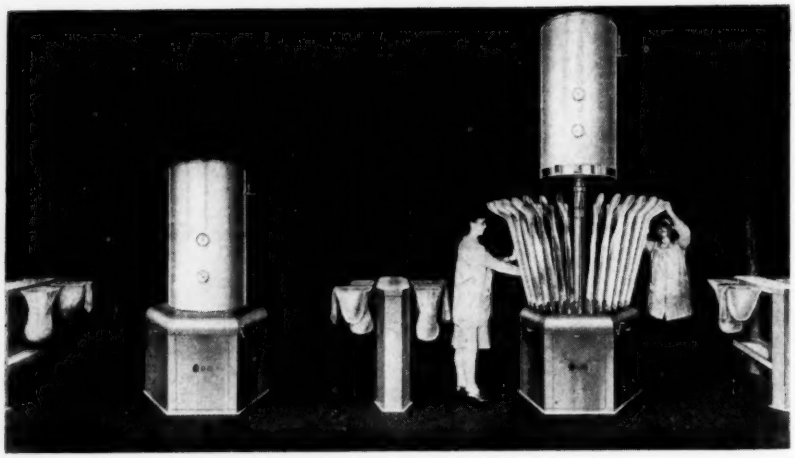
pH Meter—(MACBETH)—a line-operated pH Meter. It is claimed that the extreme simplicity of operation of the Macbeth Line-operated pH Meter will make possible the use of adequate pH control in many operations, which up to the present time is not performed due to the high cost and complexity of existing pH meters.

Macbeth Line-operated pH Meter

The new Macbeth Line-operated pH Meter can be used by workmen, and assistant technicians as well as chemists. It is said to possess exclusive unique features that reduce to the minimum experience necessary for obtaining pH readings. Only one control in addition to the electrode switch is used, greatly increasing the number and type of workers who can easily operate the pH Meter. pH values are read directly on the scale in .1 units over the full range of 0-14 pH.

Since no batteries are used, the Macbeth Line-operated pH Meter can be left on continuously. This new meter will be sold only through laboratory supply dealers.

Proctor Preboarding Machine—(PROCTOR & SCHWARTZ)—for Nylon Hosiery. This machine is said to replace all former intricate, cumbersome machines, yet, is capable of even greater production. The new Proctor unit, which occupies only



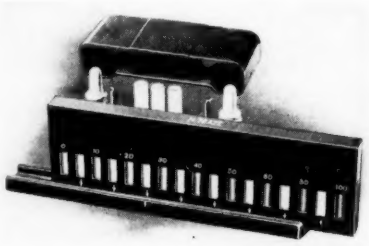
Proctor Preboarding Machines in operation. While boarders place stockings on boards on machine at right, steaming process is taking place in the machine at left. By the time boarders finish placing stockings on machine at right, the steaming process will be completed in machine at left and the cylinder of that machine will be automatically rising. Boarders will then move to that machine, strip finished stockings from the boards and replace with others. This cycle makes possible continuous operation and assures economical production.

about 10 square feet of floor space, is free of all unnecessary mechanical devices.

Each machine has a capacity of 18 dozen pairs of hosiery per hour. However, since the machines are operated in pairs, by two boarders who work together on one machine and then on the other, the capacity production of the two boarders on the machines is therefore 36 dozen pairs of stockings per hour. However, only one boarder is required for each machine in use. The machines require no laborious work on the part of the operators, other than the actual stripping and boarding of the stockings. The arrangement of the boards is such that this may be done with a minimum of effort. Proctorized aluminum hosiery boards are equipped with detachable toes, which enables the operators to change them from one size to another with a minimum loss of time. It is stated that the small amount of electrical current and steam required to operate these machines makes for very definite economy. The simplicity of design is said to assure long and trouble-free life. The unit is shipped completely assembled, requiring no assembly aside from steam and electrical connections.

Taylor-Betz Nitrate Slide Comparator—(TAYLOR)—designed to determine nitrate concentration of boiler water where nitratehydroxide ratios are maintained to control tendencies toward caustic embrittlement. The method was developed in the laboratory of W. H. & L. D. Betz, Philadelphia, Pa., and adapted to the Taylor Slide Comparator by W. A. Taylor & Co., who are marketing the outfit.

The set consists of a Taylor pH Slide Comparator base, a color standard slide with 9 standards representing 0, 10, 20, 30, 40, 50, 60, 80, 100 ppm of nitrate as NO_3, five 5ml test tubes, 2 vials of Brucine reagent, pipette, 16 oz. concentrated sulfuric acid, 10ml graduate and 100ml beaker. The slide can be used on any Taylor pH or Phosphate Comparator base. A determination is made by placing 5ml of the boiler water in the beaker and adding measured quantities of Brucine and sulfuric acid. Five minutes after mixing, 10ml of distilled water is added. A yellow color develops, the intensity of which is proportional to the nitrate content. A sample of the yellow mixture is placed in one of the 5ml test tubes in the base and the color compared with the standards. If the nitrate content is higher than 100 ppm NO_3, the boiler water can be diluted with nitrate free water to bring it within the range of the Comparator.



Taylor-Betz Nitrate Slide Comparator

It is stated that the accuracy of the method is not affected by ions normally present in boiler water such as phosphates, sulfites, silicates, chlorides, etc.

Titrometer— (PRECISION) —a new titrometer, which is said to accurately determine the free and combined acidity of material in either aqueous or non-aqueous highly colored or opaque solutions. The instrument was originated by the Shell Development Laboratories primarily for determining the acidity of highly complex mixtures of lubricating oils, either completely opaque or so dark in color that the routine acidimetric color titrations could not be made. However, the titrometer has been found applicable to determine the acidity of used lubricants, detergents, fats, turbine oils, oil additives, motor oil sludges, asphaltenes, crude oils, asphalt, asphalt residues, distillates, distillate bottoms, polymers, rubber, vegetable and animal oils, fats, waxes, greases, common solvents and other water solutions. The potentiometer method is reliable and reproducible, and the titration media is capable of dispersing or dissolving sufficient quantities of the water insoluble materials under test.

New Titrometer of Precision Scientific Co.

The operation is similar to that of the pH determination. The instrument has two complete titration stands. The alternating current operated electrometer allows the use of any electrode system in aqueous or non-aqueous solutions. The calomel-glass electrode is readable to within 0.02 pH units. The titrometer is equipped with meter scales and potentiometer circuits which give a range of —1.65 to +1.65 volts readable to 0.5 millivolts.

Vita-Clor Floor Enamel—(VITA-VAR)—for exterior and interior floors subject to unusually severe conditions. Claimed to be extremely elastic, tough, durable and unaffected by alkaline action, permitting frequent scrubbing. Said to resist mold, mildew, acids, alkalis, moisture, oil, grease, and soap as well as bleaches, chlorine solutions and chemicals. Synthetic enamels for floors in factories and warehouses, or for floors below grade level where water seepage often prevents satisfactory painting. Trademark registered.

RAYON DYEING AND FINISHING DEVELOPMENTS

WILLIAM F. BROSNAN
Verney Mills

THE war years have witnessed the birth of a revolution in the processing technique of rayon fabrics and this reaction is bound to become more apparent as the peace time conversion gets into full swing. War-time requirements have resulted in speeding of production, dyeing and finishing to specifications, wider use of fast colors and special impetus toward utility finishes.

The field experience of members of our armed forces will undoubtedly have an influence on future civilian requirements. G.I. Joe and his mates will want more clothing of an informal character for work as well as for sports and outdoor wear. Rayon fabrics have been widely accepted in women's wear but will now become more important than ever in men's apparel.

NEW EQUIPMENT

Let us examine the progress made and see what new improvements we can expect in rayon processing. Starting in the greige or cloth room we find available a new horizontal shear which operates at high speeds. In range with a combination beaming and sewing machine it provides practically continuous sewing, shearing and beaming of pieces. In some plants the shear is also synchronized with a desizing machine which provides further streamlining of preparatory operations. There are now available products for desizing which are effective at high temperatures therefore penetrating the goods faster and producing better desizing in less time. The use of gas fired refractory burners for singeing has been rapidly adopted for excellent singeing at speeds as high as 250 to 300 yards per minute. The burners are so arranged that either or both surfaces of the fabric can be efficiently singed in a single passage through the machine.

In the boil-off and bleaching departments we find a further trend toward continuous operation. Several machines have been developed to meet the special requirements of rayon sport and dress fabrics. Continuous tensionless boil-off machines available are fundamentally based on a pre-setting or shrinking device, consisting of one or more stainless steel drums, followed by an open width festoon or conveyer type boil-off section in which the fabric is effectively scoured. Many fabrics which would show crack or break marks if scoured in rope form are satisfactorily handled on these open width tensionless machines. In addition full shrinkage is obtained and controlled through the use of these machines which can produce at the rate of 60 to 80 yards per minute. Synthetic detergents are widely used in the scouring liquids and, due to their stability, baths can be used for days and still retain their efficiency.

Flat filament rayon fabrics are also scoured continuously with a minimum of tension and distortion through the use of continuous open width machines. This type of machine is more or less conventional in the cotton industry. However for processing rayons they are usually constructed with individual direct current motors on each nip instead of the old type line shaft and bevel gear drives. Automatic compensators control the speed of the motor on each nip thus providing a minimum of tension on the rayon fabric being processed.

Of interest in the scouring or heavy cotton and rayon constructions, such as poplin and twill weaves, is the use of the so-called continuous jig. These constructions cannot be handled in rope form and the conventional jig handling is cumbersome and inefficient. The use of the continuous jig is recommended to overcome these deficiencies. The machine consists of a series of jigs or sections combined into one straight line machine so that scouring and rinsing may be carried out progressively in different sections of the machine. When fabric from the first section has been wound on the beam of the section section, the first section can again be loaded with a new roll of fabric and so on. The operation of the machine is practically continuous since, as the roll is being wound from the beam of one section onto the beam of the next section, the fabric is being scoured or rinsed as the case may be. This machine can also be used to advantage for certain types of dyeing.

BLEACHING

Fabrics of all rayon require little or no bleaching. When bleaching is required, it is usually done with mild peroxide baths. As noted above, many popular cloths are composed of cotton and rayon. Most such constructions are of the heavy or rigid type and, when bleaching is required, there is a marked trend toward the use of the cold peroxide method. In this procedure the fabric is usually impregnated through a cold peroxide bleach both, beamed wet, and allowed to stand 8 hours or overnight. Subsequently the fabric is thoroughly scoured on a jig or continuous machine.

During the war, when peroxide was scarce, many plants employed sodium chlorite for bleaching. This product is used in an acid bath and consequently its use is recommended where acetate rayon is present. It is likely that the use of sodium chlorite will be increased as more dyers and bleachers become familiar with its many advantages.

DYEING PROCEDURES

As we turn our attention to the dyeing procedures we find a further definite trend toward continuous operations. For the dyeing of commercial colors on soft rayons, dye becks are still the machines in general favor. It is noteworthy, however, that more and more plants are running their becks in continuous strands rather than in individual pieces. The results of this procedure are better uniformity of dyeing and higher production as there is only one seam to be broken and resewn when dyeing an entire lot. Automatic opening devices and continuous extraction, by vacuum or squeeze rolls, are largely replacing the cumbersome methods of centrifugal extraction and hand opening of individual pieces after dyeing.

With the trend toward faster colors and the development of tensionless equipment, greater yardages of rayon fabrics are being dyed in the open width. Dyeing pads have been greatly improved, tensionless jigs are becoming more widely adopted and, in addition, we are now witnessing the introduction of new dyeing machines and techniques. Now making their appearance are the Williams continuous dyeing machine, the DuPont multi-lap dyeing machine and the pad-steam dyeing machine. All of these machines offer advantages in gentle handling

and/or high production. The net result of these developments will be the production of a much larger volume of fast dyed rayons than heretofore.

DYEING OF ACETATE RAYON

In recent years acetate rayon has become increasingly more prominent. This is particularly true in constructions in which acetate, either filament or spun, has been blended with viscose and other fibers to produce many desirable fabrics for women's and men's wear. Consequently the dyeing processes for acetate have received considerable attention.

The dyeing of acetate in blue shades, or shades containing a blue component, has always been troublesome due to the lack of fastness of the available dyes. The anthraquinone blues have afforded satisfactory light fastness but poor fastness to acid fumes. The azo blues have been superior in fume fastness but have proven to have poor penetrating qualities under ordinary conditions and, in general, their light fastness has not been satisfactory. Of the anthraquinone types there is one blue which has proven to be the best dye available. It offers a combination of good light and fume fastness but, for many end uses, even this color requires treatment with an inhibitor to provide suitable fume fastness. The azo blues are difficult to dye. They require high dyeing temperatures to obtain penetration and levelness. These types are suitably dyed on jigs which are totally enclosed so as to maintain a uniform high temperature throughout the dyeing procedure. For beck dyeing the azo blues are generally unsatisfactory. Many dyers however have adopted a procedure of using a mixture of the best anthraquinone blue and one of the azo types to supply the required blue component. By this technique dyeings are produced which exhibit fairly good fastness to light and gas fumes.

GAS FADING INHIBITORS

In the field of inhibitors much attention has been given to the use of amines. Several amines have been found to give suitable protection against gas fading. Among the compounds recommended for this purpose are the ethanolamines, beta-hydroxyl-ethyl ethylene diamine and melamine. These products have varying effects upon the fastness and shade of dyed viscose, consequently they are of particular advantage on fabrics of all acetate. Melamine is the most resistant to washing and dry cleaning.

OTHER DYESTUFFS ON ACETATE

Another approach to the problem of fast colors for acetate involves the application of certain acid, vat and vat leuco-ester dyestuffs. The acid colors can be applied to acetate, by padding, from baths containing an acetate swelling agent. Alcohol, formic acid and zinc thiocyanate have been used for this purpose. The use of these chemicals causes the acetate to swell thus permitting penetration of the fiber by the acid dyestuff. The leuco-esters of vat colors can also be applied in this manner though of course the fabric must be oxidized with sodium nitrite and sulfuric acid to develop the vat dyestuff in the fiber. The acid colors merely require rinsing and neutralizing after padding. Vat colors have been applied to acetate by the pigment pad-jig method with and without the use of swelling agents. In most cases the vat dyeing results in almost complete saponification of the acetate. In general the indigoid types are more easily applied than the faster anthraquinone derivatives. Considerable thought is being given to the application of vat colors to mixed fabrics of acetate and viscose. Developments along these lines will be carefully watched for future improvements.

PROCESSING OF NYLON

Nylon fabrics are once more making their appearance in the civilian market. In the processing of nylon fabrics the dyer must keep in mind an inherent property of nylon often referred to as its "memory." By this term we refer to the ability of nylon to assume certain important physical characteristics through the action of water and/or steam at high temperatures. After such treatment the nylon is "set" in dimensions, etc. It is considered good practice to set the nylon fabric at full width with boiling water or steam as a preliminary to dyeing and finishing. In the subsequent processing the temperature is never allowed to attain a higher degree than during the setting treatment. This method of procedure produces a fabric of stable dimensions and eliminates the danger of permanent creases or breaks arising during the dyeing process.

Nylon is usually dyed with acetate colors for commercial work. Where better fastness is required, nylon fabrics are being dyed with chrome colors and metalized acid types. These colors are commonly dyed from a boiling formic and/or sulfuric acid bath in an enclosed jig. They can also be applied by a pad-jig or pad-steam procedure. The acetate colors give the greater freedom from warp streaks. Fast colors, in light shades, are also being produced with pigment colors.

PIGMENT COLORING MATERIALS

No discussion of dyeing developments would be complete without consideration of the growing importance of the pigment coloring materials. The war years saw a greatly increased yardage production of fabrics dyed and printed with pigment colors. These coloring matters are very simple of application. They are usually padded or printed onto the fabric from a clear lacquer or resin solution and subsequently dried. The drying is followed by curing to set the resin binder. These pigment dispersions or emulsions do not exhibit any special affinity for fibers, consequently the dyeing procedure is actually a mechanical or physical one. As a corollary to this fact, pigment dyeing is possible on practically any fiber which can be suitably impregnated with the pigment coloring materials. Consequently, the pigment types are particularly efficacious for the coloring of fibers exhibiting poor affinity for the common organic dyestuffs. Among the newer synthetic fibers which have poor affinity for organic coloring matters are the saponified acetates, the high tenacity viscose types and nylon. These fibers as well as Fiberglas are satisfactorily dyed by the pigment method. Pigment colors are of course suitable as well far the common types of synthetic and natural cellulosic fibers. The pigment dyeings, in general, are quite fast to light and washing, however, in dark shades, they have a disadvantage in poor crocking fastness. Undoubtedly an improvement in this characteristic will result in a much wider use of pigment colors in the future, and this development will be carefully watched by textile processors.

BLENDED FABRICS

In the apparel field, both men's and women's, the dyer is finding more and more blended fabrics making use of staple viscose in combination with spun acetate, casein fiber and wool. The processing of these blends is relatively simple. They are usually dyed in rope form in stainless steel becks with as little tension as possible. The important fact to remember in the handling of these fabrics is the avoidance of high temperatures and strong alkalies which have adverse effects on the acetate, casein and animal fibers. In the case of viscose and wool blends, good practice dictates the employment of a preliminary crabbing operation to avoid crease and break marks in the dyed fabrics. Blended fabrics of viscose and wool are being successfully dyed with vat colors by the pigment pad method. In this procedure the alkali in the reduction bath is carefully buffered to prevent degradation of the wool.

PRINTING

Improvements in mechanical and electrical equipment are resulting in higher speeds of printing machines. New high precision printing machines are completely

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RECONVERSION OF THE DYESTUFF INDUSTRY

HENRY F. HERRMANN
General Dyestuff Corp.

THE term reconversion is frequently interpreted as implying a transformation and in this sense does not apply to the plans now in prospect and the conduct of the dyestuff industry since V-J Day. The chief desires of this industry are to restore its plants to the functions which were interrupted by the war; to make the repairs and replacements which war shortages of materials, labor and priorities did not permit; to execute projects involving new buildings and installations which had to be tabled for the duration; to dispose of large inventories of finished dyes, partly processed intermediates and raw materials intended for war contracts which are either of no interest to the post-war market or will take years to liquidate; last, but not least, to move out of the production lines special equipment useful only for such obsolete dyestuffs.

In the same manner as manufacturing facilities were dedicated to the major task of winning our country's wars, the industry's research activity also was engrossed with problems of military importance. It follows that few, if any, discoveries of major importance to the postwar civilian economy were made during the war and no developments of transcendent value can be expected in the near future. This statement is not an apology for lack of progress and it must be fully comprehended before the transitional plans of the dyestuff industry can be properly evaluated.

Most of the industries which supply the household appliances, vehicles and other equipment of direct interest to the general public have created an aura of expectation of fantastic developments born of war research and implemented by postwar retooling. This is not the case with dyestuffs. With possibly a few exceptions all the dyes and auxiliary chemicals which occupy the industry's present reconversion plans were known before the war and were commercially available. During the war, military exigencies reduced the supply but few, if any, disappeared from the market.

The absence of dyes of foreign origin is frequently referred to as having created a situation in the textile industry justifying claims of inferior fastness properties of dyed and printed fabrics. Spurious merchandising propaganda has rooted this idea in the general public and further aggravated it by the innuendo that American dyes supplied during the war were not of the same quality as formerly. The first statement is of exaggerated importance; the second allegation is untrue.

When this country approached the war with Germany only 3 per cent of the dyestuffs in common use were imported. Admittedly these foreign dyes represented the ultimate of technical achievement otherwise they would not have found buyers at the high prices they commanded. The important point is that they permitted American textile mills to duplicate imported fabrics based on the same dyes in regular use by foreign manufacturers. With them dyers and printers could produce shades and styles which were not readily obtainable with domestic dyes. All that was necessary when the war stopped the supply of these specialty products was the elimination of a few fabric styles which were dependent on them. One can assume that 98 per cent of this country's textile production before the war did not involve foreign dyes and the elimination of the remaining small percentage by the war was of relatively little consequence to the industry, or the public. Efforts will be made to restore the most important of these specialty products through domestic manufacture but eventually they will serve as adornments to the line rather than basic essentials. It is not true that the absence of foreign dyes has caused inferior fastness properties of American fabrics.

One frequently hears the statment that the dyes delivered by American manufacturers during the war were inferior to their own pre-war production. There is no factual basis for any such claim. Dyestuffs are definite chemical compounds. The only alternative to making a given product is to drop it temporarily if the raw materials are unobtainable. There is no such thing as "half" making it or producing it in sub-standard quality. Dyestuff manufacturers did not resort to inferior substitutes and postwar reconversion does not involve the recalling or replacement of war substitutes. Most dyestuffs are listed by name, manufacturer and chemical structure in the British Color Index and the Glossary of American dyes which appears in the Year Book of the AATCC. The products supplied by our industry during the war coincided with their published structural characteristics. Subterfuges were the exception and do not warrant serious consideration. This point can be clarified by contrasting dyestuffs with automobile tires or golf balls. The manufacture of first class tires out of synthetic rubber remains a hope rather than a matter of assurance. Golfers have to use reprocessed balls or quit the game. Balls of synthetic rubber are being made but are admittedly inferior to the pre-war product derived from plantation rubber. The manufacture of the latter is now possible because of our victory over Japan but the new balls will not appear on the open market until the inventories of war substitutes have been liquidated. No parallel to this situation confronts dyestuff manufacturers or consumers.

Another bone of contention was the so-called shortage of dyes during the war and the innuendo that the better dyes were in shorter supply than the cheaper ones. Conservation Order M-103 regulated the manufacture and consumption of dyes during the war and imposed restrictions which may have been hardships on a few operators but they were the exceptions. The industry as a whole benefited from this order since it prevented hoarding and speculation and placed all concerned on an equable footing. The base period for the order was 1941, which represented a year of high activity. At no time did the order reduce the legal supply of dyes below 60 per cent of the 1941 consumption, with military requirements entirely exempted. Considering the fact that cotton, wool and rayon were less available than these dyestuff quotas it is apparent that throughout the war the average finishing plant had at its disposal a very reasonable dyestuff allotment. Those that did not had the privilege of appealing to the War Production Board for special consideration.

In the case of dyes derived from Anthraquinone, the quotas assigned by Conservation Order M-103 were on a poundage basis but for other classes of dyes the criterion was the money spent during the base period. The order left to each finishing plant the choice of how it would

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RECENT TEXTILE DEVELOPMENTS IN BRITAIN

A. J. HALL, B.Sc., F.I.C., F.T.I.

THE end of the war with Germany and with Japan has left the British textile industry in a curious position. It is virile with new ideas, new processes, and new textile materials, but it lacks labor to take advantage of this position. At the present time textile manufacturers are unable to make the progress to which they have looked forward during the years of war and so generally there is considerable disappointment all around. The markets for textile goods both in Britain and abroad which are urgently awaiting supplies have to remain unsatisfied for the time being and of course any producer must be disappointed about this.

The years of war have contributed to this position in the following way. In order that the war might be prosecuted with the utmost rigor the British public has been compulsorily deprived of textile goods for the past six years and has had to make do with all kinds of materials which in ordinary times would have been discarded. The point has now been reached when there are few old materials to use up. At the same time labor from the textile factories has been absorbed in other important wartime industries and generally the operatives there have been paid higher wages. Many textile works have been closed down for the war period.

Now that the war is over it is desirable that the factories should be reopened and that labor should go back to them both from the fighting forces and also from the munition factories. So far this return is not so rapid as most manufacturers desire. There are various reasons for this and some of the stumbling blocks to a rapid return are now being removed. But nevertheless so great is the shortage of labor for textile works that manufacturers are having to take special steps to make the industry more attractive to workers and recruitment boards have had to be set up.

However, there has been appreciable development of new ideas and processes during the war period. These always come from a limited number of technicians and war is never able to stop the flow of ideas and invention. In fact, various kinds of textiles have played so important a part in war that new ideas have been encouraged in this direction. So now it should be possible to apply these ideas and methods to the production of goods for civilian rather than war purposes. Labor shortage is one of the chief difficulties in attempting this.

As soon as the British textile industry gets into its stride it is foreseen that apart from ordinary manufacturing operations and the production of goods which have over many years proven useful and satisfactory there will be new developments for utilizing the fresh knowledge and ideas now available. It is anticipated that there will soon be a very intensive creative period in which new textile materials and methods will play their part. The more important of these may be listed as follows:

1. Use of non-felting wool.
2. Wider use of protein fibers.
3. Exploitation of nylon.
4. Utilization of high tenacity rayons made from viscose and cellulose acetate.
5. Production of specialty fibers such as glass and polymerized ethylene fibers.
6. Use of synthetic resins in finishing.
7. New machinery for dyeing and finishing.

NON-FELTING WOOL DEVELOPMENTS

The production of non-felting and therefore unshrinkable wool materials has for more than fifty years been of great interest to British textile technologists and until quite recently it was in Britain that the more important processes were being discovered. Unil about ten years ago the only method for reducing the felting power of wool was that of treating it with aqueous solutions containing active chlorine. But generally by such methods this change in the wool was obtained only at the expense of a reduced durability. Now newer methods have been devised with the idea of avoiding this defect and to a considerable extent these methods are an improvement on the older ones.

Under these circumstances manufacturers of wool materials have now available to them non-felting wool in all its various forms such as loose wool, tops, and yarns, or they have methods by which fully manufactured wool materials can be made non-felting. Such a position is highly advantageous for these reasons. It allows all kinds of wool materials to be made—they may be all-wool or mixtures of wool with other fibers such as cotton and rayon—which are resistant to shrinkage in washing and change of shape. Yet since this elimination of the felting power can be left right to the end of the finishing processes the possibility is left for the finisher to use this felting power in the early stages to bring about an improvement in the textile of the fabric or garment by closing up the fibers upon each other to secure greater softness or density.

A NEW IDEA WHICH USES RESINS

British chemists have contributed to this progress by discovery of methods which use chlorine gas, special hypochlorite solutions, and solutions of caustic alkalies in organic solvents. But recently American chemists have broken fresh ground by discovery that the felting power of wool can be reduced by deposition within the fibers of a melamine ether resin formed with the aid of formaldehyde. This discovery is very promising if it is equally effective to the other processes just mentioned since it involves no chemical degradation of the wool. Chlorine and alkalies have some degrading effect although this may be kept small by suitable control of the processing. However, it has yet to be proved that the melamine ether resin method produces so good results as the chemical processes particularly as regards permanence and absence of harshening of the handle of the wool.

Since it is foreseen that non-felting processes will be used extensively in the near future it is important to note that most of these treatments affect the dyeing properties of the wool by making shades less fast to washing when these are produced with acid wool dyes. Also the treated wool absorbs most dyes more readily at lower temperatures. Efforts are being made to counteract the lowered fastness to washing and to utilize the greater affinity for dyes.

One feature of the chlorine gas treatment should be noted. It is claimed that wool in loose form or as tops may be treated so as to become non-felting and that it is not necessary to wash out any residual chemicals. If this proves to be generally true and that the processed wool

has no corrosive effect on machinery used for dealing with the treated wool then this gas process can be advantageously employed in various directions. Most of the other processes would certainly require that the treated wool should be thoroughly washed (with necessary later drying) and freed from the chemical used. It appears that this treatment of wool tops is now being actively exploited in Britain for the easy and cheap production of wool which can be directly spun into unshrinkable or non-felting yarns. Furthermore, it is found that such yarn has a silky handle which gives it a character of its own.

When it is required to treat mixture materials of wool and cellulosic fibers then the process which uses a solution of caustic soda in white spirit for making the wool non-felting deserves special consideration, for this process has no adverse effect on the cotton or cellulose rayon which may be present.

During the war all wool socks used in the fighting services of Britain were treated so as to be unshrinkable. The experience gained is to be used in the post war period to manufacture all kinds of civilian textile materials so that these will give greater service than they have hitherto when most wool materials were left with their original felting properties.

PROTEIN FIBER DEVELOPMENTS

Considerable interest is now being taken in protein fibers and recently Messrs. I.C.I., Ltd. have announced the manufacture of Ardil—a rayon made from the protein present in peanuts. It is being made after the methods used for producing other protein fibers such as Lanital and Aralac. It is considered that peanut protein is a suitable raw mateal since these can be easily grown in large quantities.

The introduction of Ardil can be taken as another step in the direction of manufacturing wool substitutes. So far, such protein rayons are referred to as being only supplementary to wool, and of course, this is true since none of them are the equal of wool as yet. But it cannot be doubted that the idea behind these developments is to make fibers synthetically which are equal to or better than wool in much the same way as real silk is being equalled by the best types of rayon now being produced.

Protein fibers as at present produced are useful but they have durability defects which are preventing their wider use. In particular they lack the toughness or durability of wool. So the production of a wool substitute has been tackled from another angle with a fair degree of success. In the discovery of Rayolanda by Messrs. Courtaulds, Ltd. the possibility of making a wool-like fiber from cellulose has been realized. In this case the wool properties are secured by depositing a synthetic resin within the cellulose rayon fibers.

These protein fibers and animalized cellulose rayon fibers have wool dyeing properties and a softness comparable in many ways with natural wool but none of them have the felting properties of this natural fiber. So far no method has been discovered for giving an artificial fiber felting properties. The best so far achieved in this direction is to have the artificial fibers in a state of strain so that they contract lengthwise on wetting. But this is not a real equivalent of felting power. However, it is evident from the research being directed to felting that some progress may be made in the future but the problem is not an easy one.

EXPLOITATION OF NYLON

It may be stated that one of the great problems now confronting British textile manufacturers is that of adapting their methods and machinery to the use of nylon. Factories have been established in Britain for the large scale manufacture of nylon according to the methods given by the American pioneers—E. I. du Pont de Nemours & Co., Inc. A great deal of publicity has been devoted to this new synthetic fiber and the possibility that the public may expect to be able to purchase nylon goods in the near future has aroused a great deal of public interest. Most people have come to regard nylon as a most superior fiber which will enter into the manufacture of most textile materials. But as most textile technologists know this picture is somewhat too optimistic.

Nylon is a most remarkable fiber but much experiment involving failures as well as successes will be required to fit it satisfactorily into the textile industry. Its properties are so unique. However, the necessary adjustment to meet nylon is now being attempted.

America has obviously had most experience in the handling of nylon so far as its employment in yarn and fabric manufacture is concerned. But during the war period British chemists have done much work to discover new dyeing methods. In America the dyeing of nylon has been largely carried out using acetate rayon dyes—these are recommended for the coloring of nylon ladies hose. So British chemists have sought to extend the range of dyes available by investigating new methods for applying to nylon some of the other types of dyes such as acid wool dyes and direct cotton dyes. Quite a fair degree of success has been obtained in this direction and much more is now known about the special dyeing properties of nylon. Most of the new information in this field as discovered by such research workers as Whittaker, Boulton, Vickerstaff, MacGregor, and others is to be found in the war-time issues of the *Journal of the Society of Dyers and Colourists*.

In adapting dyeing methods so as to make use of wool and cotton dyes for coloring nylon it has been found that considerable advantage is obtained by pretreating the nylon with agents capable of swelling it to a limited degree. Thus a pre-steaming or a treatment with dispersions or solutions of organic substances makes nylon absorb dyes to a more useful degree. In dyeing nylon with direct cotton dyes it is recommended to have the dyebath slightly acid (acetic acid is used for this purpose) rather than alkaline as is the case with dyeing cotton.

HIGH TENACITY RAYONS

The production of cellulose and cellulose derivative rayons having a specially high tensile strength originated in Britain many years ago when it was discovered that acetate rayon could be strengthened by stretching. One can also recall that it was in Britain that a large scale attempt was made to apply the Lilienfeld process for strengthening viscose rayon by stretching this while plasticized with strong sulfuric acid. Since then steady progress has been made.

In the case of acetate rayon a great step forward was made when it was discovered that exceptionally strong fine rayon filaments could be produced by combining stretching with saponification. This method has in fact produced the strongest of all rayons. High tenacity acetate rayons are now about to be produced on a larger scale by stretching up to 500 per cent or more with and without saponification.

Viscose high tenacity rayons are also being made by use of stretching. This is carried out at the time of spinning using special coagulation conditions to give the freshly formed filaments a suitable degree of ductility.

But it has to be remembered that this high strength (up to 6 or more grams per denier) can so far only be obtained by lowering the extensibility of the rayon. If the stretching is overdone then a brittle rayon results and this, of course, has a lower durability.

It has been found that these highly stretched rayons have a lowered affinity for dyes. This is in accordance with their reduced absorption of moisture. So research is being directed towards methods for counteracting this defect although to call it a defect is perhaps over-stressing the point.

CELLULOSE ACETATE MANUFACTURE

In the case of acetate rayon improvements are now being made in the meth-

ods for manufacturing the cellulose acetate. The usual method and one that has been used since the manufacture of this type of rayon was commenced in Britain some twenty-five years ago is to acetylate cotton to form cellulose triacetate and then hydrolyze this so that there are left about 2½ instead of 3 acetyl groups per $C_6H_{10}O_5$. Ordinarily the acetylation mixture is simply diluted and then held at a suitable temperature until hydrolysis has reached a suitable point. Now it is found that better products are obtained by both diluting and neutralizing some of the mineral acid in the acetylation mixture and replacing it by an equivalent amount of a weak inorganic acid. Then in the subsequent period of hydrolysis the cellulose acetate is subject to less degradation. Thus is produced cellulose acetate which is more stable so that it does not darken so readily when heated. The hydrolysis process is also shortened.

So far no substitute appears to have been found for sulfuric acid as the best catalyst for acetylating cotton in the manufacture of cellulose acetate.

During the war period and just before, progress was being made in the production of a special range of dyes suitable for adding to the acetate spinning solution in the direct production of colored acetate rayon. It is presumed that this earlier work which involved the manufacture of dyes containing long carbon chains in their molecules will soon be utilized for it has been recognized that there is likely to be a big demand for colored rayon yarns.

POLYTHENE

Just as the Du Pont Company is associated with the discovery and production of nylon fibers so is Messrs. I.C.I., Ltd. in Britain to be credited with much pioneering effort in connection with their manufacture of polyethylene products and the manufacture of the new fiber Polythene based on these polymers. This fiber is made by the melt extrusion method employed for nylon.

Polythene fibers have a somewhat low softening point and this is likely to limit their textile uses but on the other hand their electric insulation and related properties are so valuable that they have found very special employment during the war. The latest researches on the polymerization of ethylene indicate that progress is being made in the production of tougher polymers having higher softening points and so this may indicate that improved fibers from the textile viewpoint may shortly be expected.

GLASS FIBER PROGRESS

Glass fibers are being made in Scotland and reports from the manufacturers indicate that their textile uses (restricted during the war) will soon be developed on a larger scale. It has already been shown that these fibers can be made into woven and knitted materials and that these can be dyed. Curiously enough fibers made from colored glass do not necessarily possess color having a high degree of fastness to washing. It would seem that as the glass fibers are made sufficiently fine for textile purposes so do they acquire so large a surface that detergents the more readily solubilize and remove the pigment particles present in the glass—hence the looseness of the coloring. It may yet prove better to dye glass fibers as ordinary textile fibers rather than produce them already colored.

SYNTHETIC RESINS IN TEXTILE FINISHING

In Britain the use of urea-formaldehyde resins for the finishing of textile materials has exceeded in importance the use of any other resin. This is probably because the distinction of discovering the first successful process for making cellulose fibers crease-resistant belongs to a Manchester firm. But since those early days great progress has been made in the production of synthetic resins of various kinds and it would be curious indeed if urea-formaldehyde resin retained all of its early importance. Attention is now being turned to resins which can be made by reaction of formaldehyde with cyanamide, dicyandiamide, guanidine, and melamine and derivatives of these substances.

It seems that some of these resins can be exceptionally useful for aftertreating direct dyeings on cellulose fibers so as to improve their fastness to washing. For instance, Messrs. Courtaulds, Ltd. have intimated that a product of this kind to be known as Fibrofix will be introduced in the early post war period—it has already been shown to have excellent dye fixing properties.

Synthetic resins are being adapted for use in the production of textile materials where special properties such as stiffness, resistance to moisture, lower shrinkability in washing, and novel dyeing properties are required. They are also being found useful as bonding agents in the manufacture of multi-layer or laminated fabrics.

Interest in melamine and melamine derivative resins in Britain has certainly been stimulated by the American discovery that these can be used to reduce the felting power of wool. It is also stimulated by American claims that melamine-formaldehyde resins show greater fastness to washing than do urea-formaldehyde resins similarly applied to textile materials as in the production of anti-crease finishes. Such resins appear to be limiting the use of rubber for textile purposes.

Actually in the application of synthetic resins to textile materials for the purpose of giving them a better resistance to creasing it has been found that the additional weighting simultaneously obtained is valuable. In fact it is likely that today such resin treatments would be used for weighting and bulking rayon materials even if no crease resistance was thereby produced. This fact is becoming more recognized today and so an expansion in the textile use of resins is foreseen.

The point must not be overlooked that textile developments in recent years indicate that fabrics are likely to be much more used in the manufacture of engineering articles and for constructional purposes. For instance, laminated fabrics made with the aid of synthetic resins are now very important for the production of gear wheels and other such articles. Huge amounts of fabric can be used in this way and it may be that the outlet for textile materials may become greater in this direction than for clothing. Of course, in making these articles it is not necessary to insist on the use of white resins. So phenol - formaldehyde resins are being used—they are cheaper and can be produced with properties adjusted to meet exact requirements.

TEXTILE MACHINERY

The war does not seem to have restricted new ideas concerning improved machines for processing textile materials as in dyeing and finishing. Winch and jig dyeing machines have been much improved in construction especially in so far as smoothness of working is concerned. Stainless steel has entirely ousted wood or other materials of construction since it can be so easily cleaned. But perhaps the greatest refinements have been made in tenter machines. Some textile engineers have been heard to say that the progress is so great that the fabric now controls the tenter as it passes along. Certainly these machines are now provided with most ingenious guiders to ensure the proper entry of the fabric and with weft straightening devices which are more effective than those previously available. The fabric can be brought to any desired length and width so as to allow control of the ultimate washing shrinkage of the fabric. More recently, devices have been brought out whereby the moisture present in the fabric controls the heating arrangements.

It is obvious from all that has been stated above that big improvements in textile processing are ready to be brought into use as soon as conditions allow them —conditions which are mainly governed by the supply of labor and raw materials.

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Local Sections and Their Officers

Northern New England Section

Delbert E. Ray, Chairman, Massachusetts Mohair Plush Co. Western Ave., Lowell Mass.
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Rhode Island Section

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George H. Wood, Jr., Vice-Chairman; Robert R. Farwell, Treasurer

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John B. Neely, Secretary, Burlington Mills, Yarn Dyeing Div., Burlington, N. C
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Frank F. Myers, Chairman, Geigy Co., 700 Belvoir Ave., Chattanooga, Tenn
W. K. Newman, Secretary, Peerless Woolen Mills, Rossville, Ga.
W. P. Clements, Vice-Chairman; G. R. Bellamy, Treasurer

Midwest Section

Al. J. Feit, Chairman, E. I. duPont de Nemours & Co., Inc. 7 S. Dearborn Street, Chicago, Ill.
George B. Chabot, Jr., Secretary, Calco Chemical Division, American Cyanamid Co., 146 W. Kinzie Street, Chicago, Ill.
George E. Osha, Vice-Chairman; Joseph H. Jones, Treasurer

South-Eastern Section

O. G. Edwards, Chairman, Avondale Mills, Sylacauga, Ala.
W. B. Griffin, Secretary, Kali Manufacturing Co., 939 Highland Terrace. N E Atlanta, Ga.
J. E. Smenner, Vice-Chairman; Laurie E. Whittelsey, Treasurer

STUDENT CHAPTERS

Lowell Textile Institute
North Carolina State College
Philadelphia Textile Institute
New Bedford Textile School

Members should notify the Secretary immediately of all address changes

♦ ***Victory Convention, January 3, 4 and 5, 1946*** ♦

VICTORY CONVENTION PLANS

PLANS for the Victory Convention to be held on January 3rd, 4th and 5th, 1946, at the Hotel Pennsylvania, New York City, are rapidly nearing completion. For your use and information there follow considerable tentative data regarding the Convention. Complete details will appear in the official program and in future issues of the AMERICAN DYESTUFF REPORTER.

PURPOSE OF THE MEETING

The ending of the war presented a reconversion problem to our Association as well as to you, its individual members. From 1941 on, all textile research has been enormously accelerated. A variety of new products and new processes have been developed for the Armed Services but many of them are of the greatest value to civilians as well. Military requirements kept these under a veil of secrecy but now most of the restrictions are removed and a fascinating story can be told. Furthermore, a score of technical experts are still in Germany under direction of the Army to investigate what has been accomplished there in textiles and textile chemistry. This fund of information is to be given prompt and complete publicity so it seemed particularly timely to re-establish our customary annual conventions. Therefore, to better promote scientific knowledge of textile chemistry, to further encourage practical research in new processes and chemicals, and to renew again the social ties of good fellowship among our scattered members, the New York Section cordially invites you to an Annual Meeting of our Association.

PERSONNEL SERVICE

It is hoped that the Personnel Service instituted at the Atlantic City meeting will prove especially helpful, at the Victory Convention in New York, in the relocation of returning veterans. Open without charge to all members of the Association, and all employers, this will provide opportunity for personal interviews at the Convention.

Every candidate for employment should register in advance on two blanks obtainable from the Secretary of the Association, P. O. Box 28, Lowell, Mass. Two photographs, approximately 2 x 2½ inches, will be necessary for attachment to the blanks. Late registrations, at the Convention, will be accepted so far as facilities permit.

Employers, registering with the Service at the beginning of the Convention, may consult these qualification records and arrange for appointments. Interviews will be arranged between 2 p.m. and 5 p.m. on Thursday, January 3rd; between 9 a.m. and noon, and 2 p.m. and 5 p.m. on Friday; and between 9 a.m. and noon on Saturday.

Further information can be obtained from the Secretary, or at the general registration desk in the Hotel Pennsylvania at the Convention.

EXHIBITIONS

Several dozen of our Corporate Member Converters will supply us with a selection of all types of textile fabrics which will be displayed in the large foyers of the Ball Room and Georgian Room. Here we will also exhibit a mannequin style show of finished garments and accessories supplied by courtesy of some of New York's leading stores. A large room off the foyer is reserved for an exhibit of the accomplishments of the A.A.T.C.C.—all Research Sub-Committees will show here their approved or tentative test methods by displaying testing instruments, fabrics, photos, etc. It is also intended to have another large room devoted to a military exhibit of enemy (German and Japanese) uniforms, fabrics and equipment, loaned by the U. S. Army Q.M.C. Research and Development Division and by the Bureau of Supplies and Accounts of the U. S. Navy.

TECHNICAL PROGRAM

In planning our technical sessions, which after all are the heart of any annual meeting, the greatest emphasis from first to last has been put on research—the newest products, the latest developments in textiles and textile chemicals. A particularly appropriate innovation, therefore, is the opening banquet Thursday night called "The President's Corporate Membership Banquet," at which Mr. Appel will discuss the A.A.T.C.C. research program, and Mr. Lew Hahn, the general manager of the N.R.D.G.A., will tell us how the average consumer views textile research.

All day Friday will be given over to technical sessions. In the morning, the theme is "Peacetime Applications of War Developments in Textiles." The speakers are hand-picked first on the basis of having something new and interesting to tell us in their respective fields, and second on the basis of being excellent speakers well worth hearing on any subject. In the afternoon, reports on German textiles and textile chemicals will be given by a group of experts now over there for this purpose. This latter will be doubly interesting as most of the men are our own fellow members of the A.A.T.C.C.

Three papers in this year's Intersectional Contest (Saturday afternoon at 2 p.m.) point out new developments of immediate practical application to the finishing of synthetics. Another paper covers a new testing method for flammability of consumer textiles; still another, a study of color dispersions for printing; and the final paper is a fundamental study of the ageing of dyed cotton fabrics. This year's contest is bound to be a close one and is replete with ideas that can be applied and utilized by our members. Finally, in the Olney Medal Award at the closing banquet Saturday night, we will have as medalist a leading exponent of textile research, who will describe his work in detail and through this work has made one of the great contributions of the textile industry toward the winning of the war.

PROGRAM IN SEQUENCE

Thursday, January 3, 1946

9:00 a.m.—Registration.

10:30 to 12:30—National Council Meeting.

11:30 to 5:30—Research Sub-Committee Meetings.

2:00 to 5:00—Personnel Service.

4:00 to 5:30—Reception for lady guests.

7:30—The President's Corporate Membership Dinner.

Address of Welcome, Emmett J. Driscoll, Chairman, New York Section.

"Textile Research of the A.A.T.C.C.," William D. Appel, President, A. A. T. C. C.

"The Consumer's Views on Textile Research," Lew Hahn, general manager, National Retail Dry Goods Assn.

Friday, January 4, 1946

9:00 A. M.—Registration continued.

9:00 to 12:00—Personnel Service.

9:30 to 12:00 — Technical Session on "Peacetime Applications of War Developments in Textiles."

9:30—I—In Relation to Synthetic Fibers

a. Viscose—Dr. F. Bonnet, Director, Standards Dept., American Viscose Company.

b. Acetate—Dr. Harold D. W. Smith, Treasurer and Textile Technologist, A. M. Tenney Associates.

c. Nylon—George J. Groh, Nylon Fabric Development Manager, Nylon Division, E. I. duPont de Nemours & Co., Inc.

10:30—II—Regarding Textile Testing. Prof. E. R. Schwarz, Professor of Textile Technology, Massachusetts Institute of Technology.

11:00—III—Dyeing and Finishing. Dr. William Lee, Office of Quartermaster General, Research and Development Division.

11:30—IV—Textile Plastics. Dr. D. H. Powers, Monsanto Chemical Co.

12:00 to 1:30—Lunch for national officers, sectional officers and guest speakers.

2:00 to 5:00—Personnel Service.

2:30 to 5:30—Reports by technical experts returning from Germany. William D. Appel, President, A. A. T. C. C., presiding.

Saturday, January 5, 1946

9:00 a.m.—Registration continued.

9:00 to 12:00—Personnel Service.

9:30 to 12:00—General Research Meeting, open to all. Dr. Louis A. Olney, Director of Research, A.A.T.C.C., presiding. Reports of work done, by Sub-Committee Chairmen.

12:30 p.m.—Luncheon, Council and Research Committee.

2:00 to 4:00—Annual Intersectional Contest. Kenneth H. Barnard, National Chairman, Intersectional Contest, presiding.

Northern New England Section: "The Mechanics of Zone Control in Resin Finishing" by Walter J. Hamburger, Author and Chairman of Contest Committee. Judge: Frank J. O'Neil.

Rhode Island Section: "Factors which Cause or Prevent Color Agglomeration" by R. W. Jacoby. Earl McLeod, Chairman of Contest Committee. Judge: Arthur E. Hirst.

New York Section: "Evaluation of Textile Fabrics and Finishes for Flame Resistance" by Charles W. Dorn, Chairman of Contest Committee. Judge: Patrick J. Kennedy.

Philadelphia Section: "Some Effects of Dry Heat in the Properties of Nylon Fabrics" by Arthur W. Etchells, Chairman of Contest Committee. Judge: Prof. Percival Theel.

Piedmont Section: "Practical Effects of Stretching Synthetic Yarns" by John E. Bell, Chairman of Contest Committee. Judge: Dr. Raphael Rupp.

Southeastern Section: "How Different Types of Dyestuffs Affect the Rate of Deterioration of Cloth Exposed to Washing" by Matthew T. Barnhill, Chairman of Contest Committee. Judge: William B. Griffin.

South Central Section: Judge: Frank F. Myers.

Mid-West Section: Judge: Al J. Feit.

Chief Justice: Dr. Louis A. Olney.

7:30—Annual Banquet.

Award of Intersectional Prizes.

Olney Medal Award.

The Medalist, the Man, by Alban Eavenson.

The Medalist, the Scientist, by Harvey A. Neville.

Presentation of the Medal, by A. P. Howes.

Address by the Medalist.

HOTEL ACCOMMODATIONS

All members of the Association have received application forms for room reservations during the Victory Convention. These forms should be filled out and returned to the Housing Bureau, American Association of Textile Chemists and Colorists, Room 1536, 233 Broadway, New York 7, N. Y., at the earliest possible moment. Any member who did not receive an application form may obtain one by writing to the AMERICAN DYESTUFF REPORTER.

REGISTRATION

A requirement for admittance to meetings, the President's Corporate Membership Dinner, and the Annual Banquet will be the identification badge issued to all who register. You are urged to register immediately upon arrival in the foyer of the Grand Ball Room. Those who purchase tickets in advance will obtain the badge merely by presenting the ticket.

FEES

The total cost for attendance at all meetings, registration, the President's Corporate Membership Dinner, and the Annual Banquet, will be $15.00 per person. Separate tickets, covering registration and either the President's Corporate Membership Dinner or the Annual Banquet, may be purchased at a cost of $9.00 to members and lady guests and $10.00 to men guests. Members' lady guests, who desire to attend only the Annual Banquet on Saturday evening, January 5th, may obtain tickets at $6.00 each, providing they are purchased in advance. Registration tickets, covering admittance to the meetings only, may be purchased by members and lady guests for $3.00 and by men guests for $4.00. Prices of dinner tickets include gratuities.

PURCHASING TICKETS IN ADVANCE

You are urged to obtain tickets in advance in order to save time at the registration desk. You will receive an identification badge by showing your ticket at the desk. Send your order so that it may be received no later than December 24th, so that you will receive your tickets before the time of the meeting. Due to mailing conditions at that time of the year, reservations received after the 24th will be held for you at the registration desk. Tickets may be obtained from Grace B. Burton, Howes Publishing Co., One Madison Ave., New York 10, N. Y. Check, payable to Paul J. Luck, Treasurer, should accompany your order.

RESERVED TABLES

Tables will not be reserved at either the President's Corporate Membership Dinner or the Annual Banquet. As there will be plenty of seating space available in the main Ball Room, you may obtain a table for your group by arriving early.

RECEPTION COMMITTEE

There is a reception committee for both the ladies and the men. The members of these committees will aid members and their guests in every way possible.

COMMITTEES

EXECUTIVE ADMINISTRATIVE COMMITTEE

General—Emmett J. Driscoll.

Exhibits—Dr. Herman E. Hager.

Hotel, Finance, Registration—Paul J. Luck.

Printing, Personnel Service—Norman A. Johnson.

Technical Program—Kenneth Barnard.

Publicity—Winn Chase.

General Reception—S. M. Conn.

SUB-COMMITTEES

Registration Committee—John H. Hennessey, Chairman; Nelson F. Mellin, William F. Brosnan, Donald L. Griswold.

Banquet Committee—R. Timothy Gibson, Chairman; Clark Heydon, Milton Emerson.

Ladies' Committee — Mary Danley, Chairman; Bernice S. Bronner, Antoinette Falcone, Grace L. Kentos, Dorothy T. Koush, Dorothy Onufer, Minnie Wunsch.

Publicity Committee—John A. Cairns, Chairman.

Technical Program Committee—Charles W. Dorn, Chairman; Carl Patton, Vice-Chairman; Arthur Wachter, Henry Young, Herbert Scull, Frank Stutz, R. E. Sumner, Dr. W. E. Coughlin, Leonard Little, Emmett Driscoll, Dr. Herman E. Hager.

Reception Committee—George L. Baxter, Chairman; Howard D. Clayton, Frank B. Brennan, Felix L. Bume, George F. Gaede, Robert Burns, Arthur R. Wachter, Frank Stutz, Thomas D. Ainslee, A. J. Feit (Mid-West); Sidney M. Cone, (Piedmont); R. E. Rupp, (Piedmont); Harold B. Sturtevant, (R. I.); A. K. Haynes, (Southeastern).

Exhibition Committee—Dr. Herman E. Hager, Chairman; Ruth Corby, Margaret Hayden Rorke, Dr. W. E. Coughlin.

A New Tool for Evaluating COLOR TRANSFERENCE

W. A. HOLST
Secretary, Subcommittee on Transference of Color

THE American Association of Textile Chemists and Colorists has for many years sponsored a series of standard test procedures designed to assist technicians in arriving at a reliable judgment on the fastness properties of colored textiles. These tests have not remained static but have been subjected to reconsideration, leading to revision and improvement, as found desirable in order to keep pace with changing trade demands, or as found possible with the advent of new developments in technique or instrumentation. The A.A.T.C.C. standard testing methods for this reason have achieved a fundamental status in this country and have enjoyed corresponding recognition in the textile industry throughout the world.

In pursuance of its policy of constantly striving to improve upon existing test methods from the standpoints of accuracy, consistency and simplicity, the Research Committee recently adopted, as a Tentative Method, a new procedure for the evaluation of Transference of Color, involving the use of a color chart specifically designed for this purpose and improved by modifications found desirable after application to many varied problems in this field. The final device, known as the "AATCC Chart for Measuring Transference of Color," has been manufactured and is now available for distribution to the industry through the Secretary of the Association, and it is the purpose of this article to give some indication as to the scope of its anticipated usefulness, the principles of its design, and its modus operandi.

Color transference may be defined as the migration of color from the dyed material being tested to an originally undyed fiber, included in the test for the purpose of rating the sample with respect to this usually undesirable tendency. Considering the standard test methods of the Association, color transference is therefore the single item of interest involved in tests for fastness to sublimation and crocking, and is of considerable importance in the tests for fastness to perspiration, washing, water, sea water, steaming, bleaching, dry cleaning, and damp hot pressing. In some of these fastness tests, after subjecting the dyed sample to rigorously specified treatments designed to enable its fastness to be determined accurately, the color transference component of its final fastness rating is evaluated by reference to descriptive but loosely defined and highly subjective characterizations, such as "slightly," "appreciably," and "considerably." The advantages of having available an accurately gradated series of color specimens for direct and simple comparison, leading to a much more objective and precise determination on a numerical scale, are obvious. In some other fastness tests, the color transference component is rated by comparison with the results obtained by identical testing technique on a series of several standard dyeings, chosen to represent varying degrees of fastness. This method of course requires occasional replenishment of the standard dyeings when they are depleted, and introduces possible inaccuracies due to variations in fastness of the successive dyed standards, caused by unavoidable deviations in the particular lot of dyestuff used, the technique of dye application, the fiber being dyed, or the preparatory processes prior to dyeing. In addition, the hue of the sample being tested will only occasionally be similar to the hues of the dyed standards, so that the necessary comparison in tinctorial strength between unrelated hues may often be difficult and rather unreliable. This same difficulty in comparing dissimilar colors applies also to rating methods which have received some recognition and which employ a neutral gray scale for evaluation. The use of the color transference chart eliminates the necessity for standard dyeings, therefore removing this possible source of error and inconsistency, and, since its range broadly covers the entire color scale, comparison is rendered less difficult and more objective, with resulting increased precision.

In addition to its projected use in the specific fastness tests mentioned, preliminary reports have indicated that the chart will have considerable utility in other applications concerned with the numerical rating of small color differences.

The chart as finally issued makes use of 24 color chips selected from the well known Munsell Book of Color, comprising six colors, namely, neutral gray, red, yellow, green, blue and purple. The neutral gray and the various hues are each shown in four depths, ranging from a very light tint to a moderately deep shade. In terms of the Munsell nomenclature defining hue, value and chroma, the neutral grays are shown at values 9, 8, 7 and 6, and the hues 5R, 5Y, 5G, 5B and 5P are correspondingly shown at 9/1, 8/2, 7/2 and 6/2 value and chroma. For our purpose, the Munsell chips have the decided advantage that they have received official recognition as a secondary color standard, since their specification in fundamental physical units is on record. In using the chart, however, no knowledge of the Munsell system is required, as comparison and rating are carried out by the purely visual methods used by colorists from time immemorial.

The chips in the chart are mounted on white cardboard in four horizontal rows, each starting with neutral gray and ending with the purple hue. The rows are placed and aligned so that every color shows a similar gradation in depth in a vertical line, the lightest tints being on the top row and the heaviest on the bottom, and for rating purposes the rows are designated numerically, No. 4 being assigned to the top row, or lightest colors, and so on down to No. 1 for the bottom row, or heaviest colors. The rows are mounted with sufficient separation between them to show circular holes cut in the card over each chip in the four rows. A white cardboard mask is provided containing three holes in a straight line, so that when held vertically over the chart, the rectangular opening in the middle of the mask discloses one of the circular openings in the color chart, and the two circular holes on either side of the rectangular opening in the mask will expose circular areas of the vertically adjacent color chips, equal in area to the sample visible through the hole in the card itself. The middle hole in the mask is rectangular rather than circular, so as to make easier and less critical the placing of the mask to show the full circular area of the sample being rated.

The purpose of the mask is of course to make evaluation more accurate by hiding from the eye of the observer the possibly distracting color chips adjacent to the specific vertical row being used.

The question may arise as to why only the five principal hues and neutral gray were selected from the gamut of the Munsell chips, when undoubtedly the inclusion of intermediate or secondary hues would permit a closer approximation in shade to many test samples. Very careful consideration was given to this possibility for improvement, but tests on a large variety of shades indicated quite clearly that any increase in accuracy so gained would be negligible in comparison with the definite disadvantages of greater bulk and unwieldiness, as well as the attendant greater difficulty and higher cost of assembling in convenient form.

The method by which the chart is used to evaluate transference of color is probably fairly obvious from the above description, and the chart itself contains rather explicit instructions as well as helpful suggestions. In general terms, the material exhibiting the transferred color to be evaluated numerically is placed behind the card on which the chips are mounted, so that a representative part of the colored portion is visible through one of the circular holes in the vertical column closest to it in character of shade. It is then moved up or down in this column so that, if possible, it is intermediate between a chip showing greater intensity of color and one showing less intensity. In determining the final position and in assigning the numerical rating the use of the mask may be found helpful. In order to aid in holding the sample in this position while evaluating, the cover of the chart is constructed so that it may be folded back to act as a clamp. Tests have shown that there is little difference between ratings made in daylight and ordinary tungsten light; however in conformity with usual color practice, it is recommended that average north skylight or equivalent artificial light be used. The usual working distance of about 15 inches from the eye in a plane perpendicular to the line of vision will be found satisfactory, and of course the angle of illumination should be such that glare is absent. It should be borne in mind that in evaluating color on a thin semi-transparent material, the color of the surface on which the test material may be mounted, or if unmounted, the color or printing on the front page of the chart, if used as a clamp, may influence the rating. In such cases, the specimen should be backed with several layers of clean test cloth in order to eliminate this possible source of error. The natural color of the test cloth itself is of importance for critical evaluation, and where possible it is recommended that the uncolored cloth have a degree of whiteness equivalent to Munsell value 9.3-9.5. Some test procedures, such as crocking tests, may leave on the specimen a loosely adhering surface layer of colored fibers, which should be brushed off before placing the material in position on the chart.

Numerical ratings are determined by comparison with the numbered rows on the chart, interpolating in cases where the color depth of the sample is intermediate between two of the rows. Trials have indicated that it is possible to estimate reasonably consistently to about one-fifth of the difference in intensity shown by adjacent chips of the same hue, and for critical work it is suggested that several estimates be made, separated by a suitable lapse of time, and that the average be finally adopted, expressed in decimal notation.

Some fastness tests, as for example perspiration tests, may result in nonuniformly colored test pieces, thereby introducing some difficulty in rating. This difficulty, of course, is not related to the chart method of rating, but exists with equal force in previous methods. The suggested procedure depends somewhat upon the character of the nonuniformity; if the material shows a dappled color effect, it will be necessary to integrate mentally the overall effect. This will be found more easily accomplished if the distance from the eye to the card is increased somewhat, resulting in an averaging of the color. In other cases, where the transferred color shows noticeable variations in depth on the test material, the comparison with the standards may be made on the heaviest portion, or on a section representing the predominant depth, depending on specific instructions for the actual test being performed; it is also possible to make ratings on several areas representative of the extremes in color depth and to average them for the final rating. The use of the chart will thus permit, even in these difficult cases, a much more precise rating than was formerly obtainable.

In very pale tints, particularly in those lighter than a 4 rating, the original color of the test cloth will be found of major importance. Where this self shade is light enough to merit a Munsell value of 9.3-9.5, and possesses no very definite hue characteristics, the cardboard on which the chips are mounted may be taken as representing a 5 rating, and such conditions are recommended as conducive to utmost precision. If the test in question must be made on material not fulfilling these requirements, it will be found helpful in rating to fasten, along the top of the chart, a strip of the original test cloth, several layers thick and one half inch wide, to represent a 5 rating.

The rating method given in the chart is as follows:

Stain	*Rating*
Practically unstained	5
Stain equal to Row 4	4
Stain equal to Row 3	3
Stain equal to Row 2	2
Stain equal to Row 1	1
Stain heavier than Row 1	0

These numerical ratings have not been translated into the usual notations ranging from excellent to poor fastness, as this translation may vary with different tests and is dependent upon commercial textile standards. For some tests and fabrics a rating of 3 might represent the lowest limit of acceptability, while for others the entire range of the scale provided may be required to cover completely the degree of comparison desired.

It is hoped that all those interested in the fastness properties of dyed textiles will take the necessary steps to adopt in their testing procedures, where it is adaptable, this newly available tool, so that its inherent advantages of greater precision and consistency may be utilized for the advantage of all branches of the industry.

REFERENCES

ADR April 23, 1945, p. 166. Report of AATCC Subcommittee on Transference of Color.
AATCC Yearbook, 1945. Report of Subcommittee on Transference of Color.
JOSA 33 (1943) p. 355, 376.
JOSA 30 (1940) p. 575, 587, 591, 609, 617.

• CALENDAR OF COMING EVENTS •

Meeting, Southeastern Section, Atlanta Athletic Club, Atlanta, Ga., December 15, 1945.

Victory Convention under auspices of New York Section, Hotel Pennsylvania, New York City, January 3rd, 4th and 5th, 1946.

Council Meeting, Hotel Pennsylvania, New York City, January 3, 1946.

Meetings of Sub-Committees of Research Committee, Hotel Pennsylvania, New York City, January 3, 1946.

President's Corporate Membership Dinner, Hotel Pennsylvania, New York City, January 3, 1946.

Research Committee Meeting, Hotel Pennsylvania, New York City, January 5, 1946.

Intersectional Contest, Hotel Pennsylvania, New York City, January 5, 1946.

Award of Olney Medal and Awards of Intersectional Contest Prizes, Annual Banquet, Hotel Pennsylvania, New York City, January 5, 1946.

Meeting, Rhode Island Section, Providence Engineering Society Hall, 195 Angell Street, Providence, R. I., January 25, 1946.

Meeting, Philadelphia Section, January 18, 1946.

Meeting, New York Section, Downtown Athletic Club, 19 West Street, New York City, February 15, 1946.

♦ ***Victory Convention, January 3, 4 and 5, 1946*** ♦

MILTON HARRIS TO RECEIVE OLNEY MEDAL

Dr. Milton Harris, director of research, Milton Harris Associates, Washington, D. C., will be awarded the Olney Medal by the American Association of Textile Chemists and Colorists. The Olney Medal is awarded by the Association for outstanding achievement in the field of textile chemistry. The award will be made at the Annual Dinner of the Association to be held Jan. 5, 1946, at the Hotel Pennsylvania, New York. Dr. Harris, who is recognized as one of the foremost textile chemists in this country, formerly was director of research for the Textile Foundation and the Textile Research Institute, and at one time was Research Associate of the A.A.T.C.C. During the war, a large part of Dr. Harris' work has been for the Office of the Quartermaster General. Among the contributions which he and his associates have made to the war effort is the development of a process for rendering wool fabrics resistent to shrinking and wear. Adoption of this process by textile manufacturers has resulted in large savings to the U. S. Army for wool clothing. Another wartime project was an investigation to determine the most suitable materials and structures of clothing for use in various climates.

Dr. Harris is widely known throughout the textile and scientific field for his researches in the chemistry of animal, vegetable, and synthetic fibers. He has given liberally of his time and energy to the advancement of textile technology through his published research papers and through addresses to scientific and technical organizations, and is responsible in large measure for the success of the Textile Section Conferences at Gibson Island.

Among the important government committees on which Dr. Harris is active are the Wool Conservation Board, Office of the Quartermaster General; Subcommittee on Textiles and Cordage; Army-Navy Tropical Deterioration Project; National Defense Research Council; Subcommittee on Clothing; Committee on Medical Research; National Research Council; Bureau of Agricultural and Industrial Chemistry, U. S. Department of Agriculture; Advisory Board, Office of the Quartermaster General; Subcommittee on Wood and Plastics; National Advisory Committee for Aeronautics.

The Olney Medal is awarded by the American Association of Textile Chemists and Colorists to afford public recognition of outstanding achievements and contri.utions in the field of textile chemistry and as a testimonial to Dr. Louis A. Olney, President Emeritus of the Association, in recognition of his lifetime of devotion and multitudinous contributions to this field.

REPORT OF GAS FADING COMMITTEE

THE Gas Fading Committee has decided that, due to the fact that there are existing variables in the method of preparing the present Control Sample No. 1 for the gas fading procedure, it has undertaken to prepare and furnish to the trade a much more consistent and reliable Control Sample No. 1. This will tend to relieve the inconsistencies of dyestuff samples and dyeing techniques which were encountered in preparing the Sample No. 1 by the former method.

A unit of the new Standard Control No. 1 will contain 20 yards of a 2¼-inch satin ribbon conveniently rolled and packed in an air-tight jar. It can be purchased from the Secretary of the *A.A.T.C.C.*, Lowell Textile Institute at $2.00 per unit or $1.75 per unit in lots of ten.

The Committee is planning to present to the A.A.T.C.C. for adoption a revised method of testing whereby it will no longer be necessary to use control Samples Nos. 2 and 3 but will rely solely upon Control Sample No. 1. This will tend to simplify the method of evaluating tested fabrics.

A new type of gas-fading testing apparatus will be exhibited at the annual convention of the A.A.T.C.C. on January 3-4-5 at the Hotel Pennsylvania.

HERBERT G. SCULL, *Chairman*
A. J. KELLNER, *Secretary*

MEETING, NEW YORK SECTION

THE last meeting of the New York Section was held at the Downtown Athletic Club, 19 West Street, New York City, on Friday, October 19th. An informal dinner preceded the meeting.

Patrick J. Kennedy, chairman of the nominating committee, reported that his committee had selected A. G. Ashcroft, Director of Research, Alexander Smith & Sons Carpet Company, to be nominated as the additional councilor representing the New York Section during 1946. Mr. Ashcroft was unanimously elected. Mr. Ashcroft is a member of various associations, including A.S.T.M., T.R.I., I.R.I., A.S.A., and Institute of Carpet Manufacturers of America, Inc., serving as an active member of several committees.

Three members of the British Society of Dyers and Colourists were guests at the meeting. They were: Clifford C. Wilcock, head chemist at Courtauld's Droylsden Dyehouse, honorary secretary of the Manchester Section, member of the Publications Committee and member of the Fastness Tests Committee of S.D.C.; Dr. Henry A. Thomas, manager of the Droylsden Dyehouse and chairman of the Manchester Section of S.D.C.; and William Penn, manager of Courtauld's Coventry Dyehouse, chairman of the Midlands Section of S.D.C. and an associate member of the Textile Institute.

The chairman, Emmett Driscoll, reported on plans for the Victory Convention to be held under the auspices of the New York Section on January 3rd, 4th and 5th.

The first speaker was Werner von Bergen of Forstmann Woolen Company who discussed his trip to Germany with the textile team and illustrated his remarks with colored photo slides which he had taken during the trip. The second speaker was F. S. Richardson of the Waldrich Company who was also a member of the textile team that went to Germany. He spoke on textile wet processing in Germany. The third and fourth speakers were Arthur Wachter, manager of the "Crown" Tested Department, American Viscose Corp., and Clifford C. Wilcock. They discussed the crease resistant treatment of rayon as practiced in England. The papers presented by Messrs. Richardson, Wachter and Wilcock were published in the November 19th issue of *American Dyestuff Reporter*.

Respectfully submitted,
NORMAN A. JOHNSON, *Secretary*

Remember these dates:
January 3, 4 and 5, 1946
Hotel Pennsylvania, New York

♦ ***Victory Convention, January 3, 4 and 5, 1946*** ♦

UNEMPLOYMENT REGISTER

Members of this association, who are without employment, should forward a statement as to their qualifications and experience. This information will subsequently appear on these pages with an identifying key number. Employers are also requested to file with the American Dyestuff Reporter any vacancies which may occur in their business.

NOTICE TO EMPLOYERS

Personal Histories and Employment Records of the following applicants are on file at the office of the American Dyestuff Reporter. Prospective employers may examine them without obligation.

Key: A—Laboratory and research; B—Dyeing or printing; C—Finishing; D—Sales; E—Instruction; F—Executive.

A-2

Education—Graduate, Lowell Textile Institute, B.T.C., 1933.
Experience—Experienced as textile chemist, chemist-spotter, agricultural chemist and U. S. Army inspector on cotton, rayon, woolens and worsteds. Seeks research or control position with future. New England preferred.
Age 34; married; references.

A-3

Education—Ph.D. degree in chemistry, University of Lausanne, Switzerland. Knowledge of French, German and Russian.
Experience—Eleven years as assistant chemist and chemist in charge of laboratory with a large bleaching, dyeing, printing and finishing plant in New England. Experience in dyeing and printing cotton, rayons. Research. Five years with a textile testing laboratory of a mail order house in Midwest. Three years with an industrial research laboratory in vicinity of Boston.
Position desired in a laboratory in the East. References.

A-4

Education—B.T.C., Lowell Textile Institute, 1936.
Experience—One year as assistant to general manager in production of rubber coated textiles. Four years as assistant chemist working on the development and plant control of a number of rubber products including footwear, molded products, industrial rolls, tubing, etc. Seeks position as textile chemist or colorist or allied work.
Age 31, married; references.

A-B-1

Education—Bradford Durfee Textile School.
Experience—Eight years in dye laboratory testing dyes, matching shades, research work, trouble shooting combined with practical work on dyeing and bleaching. Two years as superintendent of dyeing, bleaching and drying. Had charge of laboratory and purchase of all materials for processing. Five years as dyer on cotton, rayon, silk and nylon. Seeks position as dyer, superintendent of dyeing and bleaching, or charge of dye laboratory.
Age 37, married, three children; references.

A-B-C-F-3

Education—High school and full apprenticeship.
Experience—Practical Dyer and finisher. Long experience on specialties for men's wear trouser trade in cottons, cotton and rayon mixtures and cotton and Celanese. Is disposing of interests in progressive finishing plant and seeks position as manager, assistant manager or technical advisor. Thoroughly understands requirements of Quartermaster, especially on herringbone construction.

A-D-1

Education—B.T.C., Lowell Textile Institute, 1922.
Experience—Three years as assistant chemist and chemist in bleachery. Twelve years as chemist with leather company, establishing laboratory, and handling purchasing of dyestuffs and chemicals. Seven years as sales engineer representing chemical company in New England for the textile and leather trades. Most recently associated with textile chemical company on sales and technical service of dyestuffs, soaps and chemical specialties. Seeks position as technical salesman.
Age 45; married, two children; references.

B-1

Education—2 years high school; 4 years dyeing, 2 years chemistry, Philadelphia Textile School.
Experience—16 years experience as a dyer in one concern. Experienced on auto cloth, wool, cotton, silk, rayon and mixtures of all kinds. Broad experience in field gained by experience in one large, wel-known mill qualifies this man, who is available for immediate employment as a dyer.
Age 37; married; 3 children; references.

B-C-1

Education—Lowell Textile Institute.
Experience—Many years of varied experience in charge of bleaching, dyeing, mercerizing, and finishing of cotton goods and rayon. Has a thorough knowledge of manufacturing, both technical and practical. Besides operation and processing, experience covers personnel management, supervision of building construction, machinery installation, production and costs. Seeks position as plant superintendent, technical engineer or consultant.
Age 65, married; references.

B-D-1

Education—Textile dyeing, college chemistry.
Experience—Over twenty-five years experience as dyer on various types of fibers and fabrics, dyestuff salesman, technical advisor on application of mildewproof and waterproof compounds and dyeing of casein fabrics. Seeks position as technical advisor and trouble shooter in viscose or protein fibers or as salesman of dyes or auxiliary compounds.
Age 47, married, four children; references.

B-D-3

Education—B.T.C., Lowell Textile Institute, 1939.
Experience—One year's experience as assistant dyer on wool felt hat bodies and raw stock, chemical control and research. Five years' experience as inspector of textiles for Q.M. depot, quality control and expediting in the finishing of cotton textiles. Seeks position as assistant superintendent, foreman, or in technical sales or research.
Age 28, married, three children; references.

C-1

Experience—Experienced as assistant finisher, finisher and superintendent of finishing since 1923. Experience on automobile cloth, boucle overcoatings, high grade men's wear worsted, low grade woolens, medium grade plaid-back overcoatings, fleece finish overcoatings. Bolivias, kerseys, medium-grade men's piece dye suitings, uniform cloth, flannels, ladies' dress goods and coatings, government serge and elastique fabrics, marine wool, flannel shirtings.
Age 37; married, 3 children; references.

PLAN NOW TO ATTEND THE

Victory Convention

Hotel Pennsylvania, New York City

January 3, 4 and 5, 1946

DON'T MISS THESE FEATURES!

PERSONNEL SERVICE
Thursday, Friday and Saturday

EXHIBITS
Thursday, Friday and Saturday

CORPORATE MEMBERSHIP DINNER
Thursday evening

TECHNICAL SESSIONS
Friday morning, Friday afternoon

GENERAL RESEARCH MEETING
Saturday morning

INTERSECTIONAL CONTEST
Saturday afternoon

ANNUAL BANQUET
OLNEY MEDAL AWARD
CONTEST AWARDS
Saturday evening

MAKE ROOM RESERVATIONS NOW!

See Page P499

PURCHASE TICKETS IN ADVANCE!

See Page P499

Under Auspices of The New York Section

♦ **Victory Convention, January 3, 4 and 5, 1946** ♦

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FIBER TERMINOLOGY

IN RECENT YEARS, and especially at the present time, the subject of Fiber Terminology has engaged the attention and interest of those interested in textiles. Until the manufacture of the nitro cellulose fiber on a commercial scale the textile industry knew no fibers other than those of natural origin. Possessing so many of the characteristic properties of silk, at least as far as appearance was concerned, it was not at all strange that it was almost immediately called artificial silk. This term of course was erroneous and in time became unsatisfactory to both users and manufacturers of silk.

With the introduction of other fibers spun by a similar process from solutions of viscose, cupra ammonium cellulose and cellulose acetate, there developed a sincere desire on the part of those interested to coin a generic word, which would define all fibers manufactured by the process of forcing a semi liquid or colloidal substance through an extremely fine orifice and then by some means coagulating the extruded substance into a solid fiber.

The term rayon, while apparently without any significant meaning, was proposed and soon accepted by textile manufacturers and the purchasing public for this purpose. As the only rayons for many years were manufactured from cellulose, obtained from wood fiber or cotton, it was natural that the term became closely associated with fibers made from cellulosic bases. When entirely new types of manufactured fibers were introduced, which in no respect had any resemblance to cellulose either in chemical composition or properties, then new names were thought desirous, in order to distinguish cellulosic rayon from these. As a result the names nylon, Vinyon and Aralac were introduced to designate fibers which have no relation whatever to cellulose. In England it was quite recently announced that the term rayon was to be officially accepted as the generic term for all fibers made by the orifice spun process. In this connection it is rather interesting to note that while England rather reluctantly adopted the term rayon some time after nearly every other country had done so, that such an endeavor to broaden the scope of the term should now originate there.

While a generic term is desirable, which might satisfactorily cover all fibers of this type, we believe it would be unfortunate to use the term rayon for this purpose. It has for so many years been associated with the fibers made from a cellulosic base that it would be confusing to extend its use beyond its present scope.

There still is the desire for a satisfactory generic term, which would cover this whole group of fibers. The trade has taken up the term synthetic fibers to cover all of these. Unfortunately, the rayons are not synthetic fibers in the true sense of the word, at least from the organic chemist's point of view. To be so, the cellulose from which they are made, which is wholly a natural vegetable product, would have to be made by the process of synthetic organic chemistry. The same is true of Aralac, which is made from casein, a natural animal product obtained from milk.

The nylons and Vinyons, on the other hand, are true synthetic fibers and each could easily be made starting with the elementary substances if so desired. For this reason these fibers are synthetic in the true sense of the word.

The term manufactured organic fibers covers the situation, and from a scientific point of view is satisfactory for a generic term, but might not be received by the trade as being as "catchy" and spectacular as the term synthetic fibers.

For some reason the names of many of these manufactured fibers terminate with the syllable "on," i.e. rayon, Vinyon, nylon, etc. It is possible that such a term as SYNTHON might be used to cover the whole range of so-called "man made" fibers and in this way satisfy the desire of all interests concerned.—L. A. O.

RESINS FOR TEXTILES

J. EDWARD LYNN, Sc.D.
American Cyanamid Company, Stamford Laboratories, Textile Laboratory

SO many articles on resins have been written that it is rather difficult to keep straight the pertinent facts. The following comments originate from information obtained during the past several years from laboratory and plant applications of synthetic resins to textiles. For lack of sufficient data the subjects of cellulose derivatives, natural resins and gums, silicones, rubber elastomers, coatings, and industrial fabrics will not be considered. The amount and diversity of the work being done in the field of textile finishing with resins makes delimitations a necessity in order to insure coverage from personal experience, rather than from hearsay. The resin work covered, deals with the treatment of consumer textiles (wearing apparel, blankets, curtains, etc.) with water dispersions of resins.

Rabold[1] has given an excellent tabular survey of the types of resins available, certain of their properties and uses, and their common trade names. A portion of the following inherently must be redundant to Rabold, but repetition is justified by the enormity of the ramifications involved. Since only a survey of the present status of impregnating resins is intended, specific information is used mainly for clarification.

Both thermosetting and thermoplastic resins have been successfully used in textile finishing. Because of their earlier development, the thermosetting resin data is more abundant and more amenable to generalization.

A sharp differentiation between thermosetting and thermoplastic resins cannot be made because minor changes in composition or in handling can make a thermoplastic resin become thermosetting and vice versa, for example, phenol formaldehydes, alkyds, vulcanizable vinyls, etc. The following generalizations are most characteristic of the types available, excluding borderline cases.

THERMOSETTING RESINS

The term thermosetting is derived from the fact that once they are properly heated they polymerize (cure) to infusible masses unaffected by further heating. However, because thermosetting textile resins are seldom completely cured, additional heating usually will have some effect. The polymerization occurs mainly by the chemical action of certain reactive groups normally accompanied by elimination of water, alcohol, or formaldehyde. The reaction is a regular chemical condensation of a "molecule" with multi-reactive groups. Because of the multi-reactivity of the primary unit, polymerization occurs in either two (branched or planar polymers) or three (cross-linked or tri-dimensional polymers) dimensions of space. The degree of polymerization (D.P.) tends to be high.

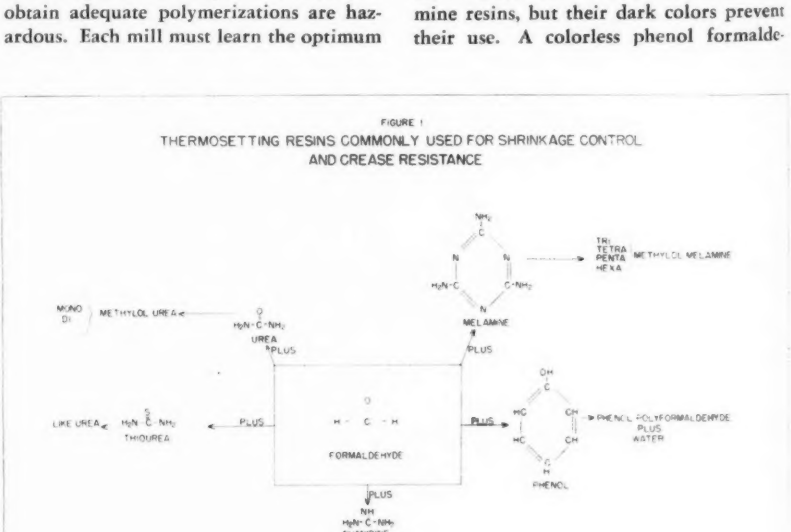
In order to obtain finishes with maximum wash fastness, polymerization is accomplished by heat and a catalyst (such as the ammonium, aluminum, zinc, etc., salts of strong acids, and the acids themselves) capable of releasing an acid under the curing conditions. Temperatures in excess of 280°F are necessary to obtain the desired results with known catalysts. Despite periodic claims of specially developed resins or catalysts giving cures at 220°-230°F, none is yet available to give a commercially satisfactory durable finish. For an adequate cure, the cloth must remain at the curing temperature for a minimum time which depends on the fabric type, weight, and construction. Because the thermal efficiencies of mill curing units vary markedly, generalizations as to the time and temperature needed to obtain adequate polymerizations are hazardous. Each mill must learn the optimum conditions for its own products and equipment.

Theoretically, many thermosetting resins can be cured at high pH (above 10). No practical use has yet been made of this fact principally because of the lack of wash-fastness of the finish, its cost, and the deleterious effect of the alkali upon the fabric.

In order to obtain crease resistance on cotton and synthetics, the resin is applied in an essentially unpolymerized (monomeric) state; all curing occurring on the cloth. The most widely used crease resistance resins are formaldehyde reaction products of urea and of melamine (Figure 1). Generally the urea resins are applied to cloth as the methylol compound, whereas the melamine methylol product is usually further reacted with an alcohol such as methanol, ethanol, or butanol.

Other nitrogen containing methylol resins such as thiourea and guanidine (Figure 1) have not proved successful on textiles. The thiourea resins have no advantage over urea resins, are more expensive and tend to develop odors and to discolor the cloth; the guanidine resins are not wash fast. Phenol formaldehyde resins (Figure 1), while not containing nitrogen, impart to cloth properties similar to those furnished by urea and melamine resins, but their dark colors prevent their use. A colorless phenol formalde-

FIGURE 1
THERMOSETTING RESINS COMMONLY USED FOR SHRINKAGE CONTROL AND CREASE RESISTANCE



hyde resin probably would find wide use.

For shrinkage control on cottons and for dimensional stability of synthetics, the same urea and melamine resins in monomeric forms find most application. However, if a substantial tensile strength loss and a stiff hand are not objectiona le, partially polymerized resins are available to give excellent shrinkage control values without altering the crease resistance. In general, the partial polymers are used for stiffening and giving body to a fabric.

For most purposes the urea and melamine monomers yield about the same results on the finished cottons and synthetics. For wool shrinkage control the melamine resins are so superior that the present urea resins cannot compete. In addition to shrinkage control and crease resistance, both resin types find use in making glazed chintzes durable to laundering, in minimizing or eliminating dye bleeding of certain non-fast colors, and as mordants for dyeing cellulosic fabrics with wool dyes (they "animalize" the cellulose). The advantages of the urea resins include low cost and more bodying due to the higher solids used. The melamine resins have much better drum stability (normally six months to a year against urea resin stability of less than six months), are simpler to make into impregnating baths because heating is not required for diluting, form baths more stable to accelerator, have less tendency to form odors, are much more resistant to chemical degradation and to boiling water. In addition, the melamine textile resins minimize the gas fading of acetate colors.

In general, the urea and melamine resins have the same drawbacks when applied to cloth. However, the degree to which they have these disadvantages are often strikingly different. Despite literature to the contrary, practically all mill and laboratory results show that both resin types cause a lowering of the tensile strength of cotton goods. The tensile loss caused by the melamine resins can be minimized, but not eliminated, by the use of a special accelerator (used in addition to the acid releasing accelerator). The loss caused by the urea resin is not as readily minimized by the special accelerator, and the cloth has a tendency to become yellow. When a cloth treated with a urea resin is chlorine bleached and not efficiently antichlored, it usually loses most of its tensile strength, especially if thoroughly ironed or pressed. Chlorine bleached melamine resin treated cloth usually does not lose tensile strength, but does turn yellow. The absorbed chlorine reacts with urea resins to form hydrochloric acid which tenders the cloth; chlorine is simply absorbed on melamine resins, does not form hydrochloric acid, and will be desorbed in time.

The effect of chlorine bleaching on cloth treated with urea or melamine resins practically demands that garments made from such cloth should never be chlorine bleached or should be given an extremely efficient antichlor. Since all present crease resistant finishes contain either urea or melamine resins, all garments made from them should contain distinctive labels warning laundries to antichlor. The need for such labels is outstanding. Because it is often impossible to tell fine carded cotton from rayon, many laundries claim they will chlorine bleach all white goods. Unless a label specifically warning against chlorine bleaching is attached, white crease resistant rayon garments probably will be, or are being, bleached.

Partially or completely polymerized thermosetting resins as solvent solutions, emulsions, or occasionally as water solutions, are used for obtaining finishes such as stiffness, fullness, pigment binding, hat finishing, backfilling, etc. A few such polymers impart shrinkage control; none now known impart crease resistance. In addition to melamine and urea resins, other thermosetting resins belonging to this class include the alkyd resins (reaction products of polyfunctional acids and polyfunctional alcohols) such as phthalic glycerides, ethylene glycol phthalates or maleates, rosin-maleic acid adducts, stabilized ester gum, etc., alone or in combination with oils such as soya, linseed, castor, etc. The combinations possible allow for much leeway in formulating a desired finish. However, the limitations of specifications for colors, stickiness, stiffness, aging, etc., often eliminate many combinations. Unless mixed with monomers or low polymers, a trend is evident that the higher the initial degree of polymerization of the impregnant, the lower the wash fastness.

In general, all textile resins can be applied by conventional two or three bowl pad mangles from water solutions or emulsions. Heavy pad pressures giving 50 per cent to 75 per cent wet pickups are usually considered desirable to obtain the best penetration and optimum results. The goods are then dried and cured under tension on pin or clip tenter frames. Because many resins depend on the elimination of water as part of their polymerization, the goods should be thoroughly dried before curing, and the moisture content of the curing section should be at a minimum. In order to obtain the most satisfactory results, separate drying and curing ovens are often advocated. Thereby, the least amount of water is in the curing chamber and no heat at the higher curing temperature is wasted during the drying stage. Using separate heated chambers, drying can be done at temperatures ranging from 180° to 240°F depending on the factors of size of chamber, speed of running, efficiency of heat transfer, etc. The curing chamber, when used either with the drying apparatus or as both a drier and a cure box, should be at a temperature of 280°F or higher—290° to 310°F are widely used temperatures, but often 350° to 400°F can be used for very short times. The length of time that goods must remain at the above temperatures in order to effect satisfactory results depends upon all the usual factors of cloth weight and thickness, amount of moisture, amount of air circulation, thermal efficiency of equipment, and so on.

After drying and curing, it is highly desirable to thoroughly wash and rinse the goods to remove excess catalyst, formaldehyde, and unpolymerized resin. Because many mills do not wash, they leave themselves vulnerable to damage suits based on dermatitis caused by formaldehyde and to bad odor developments caused by amine products. The possibility of fishy odor formation is especially pronounced in unwashed goods stored lengthy periods in warehouses or in the holds of ships for the export trade. In addition to amine odors from unwashed resin, the major source of unpleasant odor development is the use of softeners containing material which goes rancid. Softeners containing oleyl or other unsaturated groupings, or primary, secondary, and tertiary amines are most prone to develop odors and yellowness. However, for optimum results a softener should be used in the resins impregnating bath. This necessitates the choice of a correct type softener.

THERMOPLASTIC RESINS

In contrast to thermosetting resins, the thermoplastics are heat sensitive, are usually applied to textiles as polymers, generally do not give shrinkage control or crease resistance, do not lower tensile strength, and cause an increase in abrasion resistance. Thermoplastic resins generally are chain polymers with but little branching or three dimensional polymerization. As received for textile finishing work, no catalyst is needed because the monomer has already been polymerized with a catalyst such as benzoyl peroxide, lauroyl peroxide, potassium persulfate, etc. The polymer is usually supplied as an emulsion or as a solvent solution. The emulsion is much the easier to handle.

Normal textile application of thermoplastic resins is similar to that already described under thermosetting resins. Because they are fully polymerized, only drying is recommended in most plants. However, experience has shown that for optimum results, heating to the 280+°F curing temperatures is advantageous also

(Concluded on Page 510)

THE PRINTING OF WOOLENS

WILLIAM D. BAIRD

PAISLEY designs truthfully labelled—"Enchanting." Flower garden patterns that fairly exuded the sprightliness of Spring, the dazzling warmth of Summer, the glow of Autumn. Bright splashes of tropical colorings which set one to dreaming of picturesque lands far to the south. Such was the dress shop display of gaily printed woolens which brought on the foregoing poetic surge and suggested all that follows.

Wool printing, like the oceans' tides, has ebbed and flowed for many years. Since its popularity seems to be on the upswing at the moment, perhaps a brief technical survey of the subject will be timely.

Proper preparation of the goods to be printed is of the utmost importance. A smooth surfaced fabric, free of lint and beard, will naturally produce the sharpest and clearest prints. Hence, any woolen fabric-bunting, shirting, flannel, sheer, etc., should be singed on the gas or plate singeing machine as the first step of preparation. Furthermore. after any bleaching, chloring or other wet treatments, care in the drying process should be exercised to insure the required smooth surface.

Following the singeing, a scouring should be given with soap and soda or ammonia at not over 120° F., and then rinsed well.

At this point, when a ground that requires no bleaching is under treatment, it would be well to subject the goods to a chlorination. In fact, as pointed out further on, chlorination of the fabrics to be printed is practically a "must" if deep shades are considered.

When bleaching is required for reasons of shade clarity or a clear white ground, such treatment usually follows the scouring but may be given, if necessary, subsequent to chlorination and may be carried out on the jig. Hydrogen peroxide is the simplest agent—one gallon of 100 volume peroxide per each 50 gallons of cold water, made slightly alkaline with ammonia or silicate of soda. The goods are given two ends, then heated to 140° F. for two additional passes and stored for a couple of hours. A thorough rinse and acidification follows.

Wool fibers possess a natural tendency, especially under influence of steam, to reduce and partially destroy certain dyestuffs. In order to counteract such a tendency and at the same time increase the affinity of fiber for dyestuff, the woolen pieces are advisedly chlorinated. The process is important to the production of satisfactory prints but should be carried out only with the greatest of care since excessive treatment may well prove harmful, causing a harshened and yellowd fabric. The treatment may be given on the jig or full width on any suitable apparatus. If on the jig, the goods are given two ends in a cold chlorine solution made up with about one gallon of sodium hypochlorite or chloride of lime (clear) at 6° Tw. per each 100 gallons of water. At this point three quarts of sulfuric acid Sp.G. 1.84 are slowly added as the material is given two more ends, then batched for an hour or so before rinsing well to remove all traces of the chlorine. Sulfuric acid is preferred over hydrochloric because of the latter's tendency to yellow wool fibers. An anti-chlor treatment in a weak bath of sodium bisulfite may follow if necessary, plus of course, more cold rinsing.

This chloring process, if carefully applied, should give the desired results without any risk of injury to the material. However, in order to obviate any possible risk, it is suggested that consideration be given to one of the specialized products which slowly release a mild chloring action.

Careful drying at full width and examination for smoothness of surface complete the preparation.

For the printing of woolen fabrics, selected acid and direct colors are used for the most part, although certain chrome and alizarine types are applied where particularly good fastness to light and washing is sought. Where brightness of shade is stressed rather than good fastness, the basic group as well as the eosine types are given consideration. The basics, when used at all, are printed on a lightly chlored fabric in order to prevent bleeding into the white ground. A typical print paste may be made thus:—

1 lb. Basic Color
4 oz. Levelene, Cellosolve, or other solvent aid
1 gal. Acetic Acid 40%
2 gals. Water
6 gals. Thickener
4 pints Tartaric Acid-1:1
4 pints Tannic Acid and Acetic Acid-1:1

Dyestuff first pasted with the solvent aid, acetic acid added and then dissolved in the water at 160°-190° F. to which is added the thickener and after cooling, the acids for fixing.

The eosine group is generally printed with the addition of acetic or formic acids. And too, for this type of color, the goods, after chlorinating, are best treated in the padder or jig with a tin salt—i.e. —sodium stannate at about 5° Tw., acidified with weak sulfuric acid and rinsed before drying.

Most of the chrome colors may be printed with fluoride of chrome as a fixing agent. In some instances acetate of chrome and tartaric acid are employed. The print paste following may serve as an example:—

1 lb. Chrome or Alizarine Color dissolved in
4 gals. boiling water: cool and add:—
5 gals. British Gum Thickening
2 lbs. Glycerine
5 pints Chromium Fluoride Solution

Note:

Chromium Fluoride solution is made with:—

2 lbs. Chromium Fluoride Crystals dissolved in—
1 gal water together with,
1 lb. Formic Acid and,
1 pint Tartaric Acid—1:1

The following colors are some of those suitable for the foregoing formula:—

Alizarine Yellow 2G Conc. (C.I. 36)
Alizarine Yellow 4G Conc. (C.I. 52)
Anthracene Yellow C (C.I. 343)
Alizarine Orange 2GN (C.I. 40)
Erio Chrome Orange G Conc. (C.I. 274)
Chromaven Brilliant Orange 2R
Erio Chrome Red B (C.I. 652)
Chrome Red 3B Conc. (C.I. 280)
Chrome Fast Violet B (C.I. 169)
Chromaven Brilliant Blue B (C.I. 720)
Gallocyanines (C.I. 883)
Chromaven Green G
Acid Anthracene Brown PG (Pr. 4)
Chromaven Printing Brown Paste
Acid Anthracene Brown RH (C.I. 98)
Chrome Blue Black 2B Conc. (C.I. 202)

A great many colors of the acid and acid fast groups are suitable for wool printing. As fixing agents, acetic, oxalic and tartaric acids are most important. When a slower and milder fixing agent is required, the ammonium salts of these acids are employed. The stronger and faster acting sulfuric acid can be used in extreme cases, however, it is not recommended because it tends to attack the back greys and doctor blades.

A typical print paste for acid colors:—

2 lbs. Dyestuff
8 oz. Solvent aid plus 2 lbs. glycerine
4 gals. Water

Paste color with solvent, add the glycerine, dissolve in the water at the boil, cool to about 180° F. and mix in:—

6 gals. Thickener (Tragacanth and British Gum)
when cool, add
5 pints Acetic Acid 30%
2 pints Tartaric Acid—1:1

A partial list of dyestuffs suitable for use with the above formula:

Azo Yellow G Ex. (C.I. 146)
Chinoline Yellow Conc. (C.I. 801)
Naphthol Yellow S (C.I. 10)
Tartrazine (C.I. 640)
Acid Fast Yellow RS (Pr. 187)
Brilliant Milling Yellow 5G (Pr. 138)
Acid Orange Y (C.I. 151)
Acid Orange RO (C.I. 161)
Amacid Fast Orange LW
Neutral Orange G (Pr. 137)
Neutral Orange SGS (Pr. 186)
Ponceau 3RB (C.I. 280)
Amaranth Conc. (C.I. 184)
Acid Fuchsine 10B Conc. (C.I. 57)
Acid Fuchsine 4B Conc. (C.I. 30)
Amacid Brilliant Red 5B Conc. (Pr. 193)
Carmoisine B Conc. (C.I. 179)
Milling Scarlet 3R (C.I. 487)
Pontacyl Violet S4B (C.I. 698)
Acid Violet 10B (C.I. 696)
Patent Blue A (C.I. 714)
Patent Blue V (C.I. 712)
Acid Blue FG (C.I. 671)
Sulphon Cyanine 3R (C.I. 289)
Indulines (C.I. 861)
Amacid Brilliant Blue 3B (Pr. 33)
Guinea Green B (C.I. 666)
Amacid Green G (C.I. 670)
Amacid Fast Green 3G (C.I. 735)
Brilliant Milling Green B (C.I. 667)
Alizarine Green CE EX. (C.I. 1078)
Alizarine Green CG Ex. (C.I. 1078)
Sulphon Cyanine Blacks (C.I. 307)

The direct and direct fast types of colors have, in some instances, a distinct advantage over the ordinary acid colors, since, in a general way, they offer better wash fastness, also water fastness as applied to wool.

Print pastes of this group are usually prepared with sodium phosphate or borax. However, a few of these require a mild acid such as acetic acid or tartaric or their slower acting ammonium salt for proper fixation on wool. In either case it is advisable to incorporate a small amount of sodium chlorate into the print paste for a maximum of color fixation and as a protection against the reducing action of the wool and steam, particularly in the case of heavy shades and on non-chlorinated material. In fact, about 5 to 10 parts of chlorate per 1000 of paste is recommended for all types of wool printing.

A generalized print paste:—

2 lbs. Direct Color
8 oz. Cellosolve, Levelene or other solvent
2½ gals. Thickener (British Gum)
5½ gals. Water
2 lbs. Glycerine

Paste the color with the solvent aid and dissolve in water at the boil; cool and add the thickening agent and the glycerine after which are incorporated:—

2 lbs. Sodium Phosphate or Borax dissolved in, 1½ gals. water, and finally,
8 oz. Sodium Chlorate, dissolved in a small amount of water.

For colors requiring an acid for fixation, the phosphate or borax is replaced with an equal amount of acetic acid 30 per cent, tartaric acid-1:1 or the milder ammonium salt of either.

Dyes suitable for use include:—

Brilliant Yellow S (C.I. 816)
Chrysophenine (C.I. 365)
Solantine Yellow 4GL
Solantine Yellow NN (C.I. 814)
Amanil Fast Yellow BX (C.I. 814)
Amanil Fast Orange GLZ Conc. (C.I. 653)
Direct Fast Orange WS (C.I. 326)
Diamine Fast Red F (C.I. 419)
Pontamine Scarlet B Conc. (C.I. 382)
Amanil Fast Scarlet 3B Conc. (C.I. 382)
Amanil Brilliant Violet 4B
Amanil Fast Violet 2RL
Diamine Sky Blue FF (C.I. 518)
Diphenyl Dark Green BN (C.I. 583)
Amanil Green B Conc. (C.I. 593)
Amanil Brown 3GS Conc. (C.I. 596)
Chloramine Brown MR (C.I. 420)
Congo Brown RLH (C.I. 598)
Amanil Catechine GS (Pr. 69)
Amanil Catechine 3G (Pr. 70)
Direct Deep Black EW (C.I. 581)

For the machine printing of woolens, roller engravings are usually slightly deeper than those ordinarily used on cotton. Another matter requiring special attention is that of a soft base or backing in order to avoid high and low places in the finished goods. After printing, drying is carried out at a moderately low temperature. The subsequent steaming is affected at low pressure and with moist steam; generally in moist wrappings. The degree of moisture is important because, if too low, fixation is apt to be incomplete and if too high, the sharpness of pattern may suffer. Time of steaming varies from one to one and one-half hours according to the nature of the color and depth of shade.

After steaming, the goods are washed well with plenty of cold water, warm if necessary. Hot water should be avoided to prevent possible staining of the white or lighter ground, and feathering.

Finishing is carried out in an appropriate and convenient manner.

Block or hand printing of woolen piece goods is still occasionally made use of for the production of multi-colored articles. The dyestuffs and print pastes are prepared in much the same manner as for machine or roller printing. Steaming and finishing of hand printed materials are likewise carried out as in roller printing. The same is true for spray printing with the one exception that print pastes are thinned out for greater ease of handling.

The printing of slubbing or "vigoureux" printing employs only a thorough cleansing or scouring in preparation of the material. No chlorinating is advised since the strength of the fiber would be impaired by such treatment. After a careful combing the slubbing may be printed with the same print pastes and colors as are used for piece goods.

Finally, a word of caution is in order regarding the use of proper thickeners in the print pastes. It is well to avoid thickeners which contain large quantities of starches since these are not easily removed in the final washing. The more easily solubilized gums such as British Gums and Gum Tragacanth are recommended because these produce sharper prints and are washed out with greater facility. A comparatively recent and valuable contribution to this phase of textile printing is a crystal clear and easily solubilized synthetic gum which is produced from a cellulose base.

Rayon Dyeing—

(Continued from Page 492)

roller bearing, and are equipped with integral blanket washing devices. One such blanket washing machine employs an inclined angular doctor which removes excess water and allows the blanket to be returned to the printing machine without further drying. A further development is the eliminaiton of grey goods in the printing of many fabrics and the resulting elimination of grey dryers. It is claimed that, with special cloth handling and feeding devices, these high precision machines can be operated at speeds of 250 to 300 yards per minute.

DRYING

The various fabric drying operations have received considerable attention by finishers and machinery designers. Modern dry cans are constructed of stainless steel and have anti-friction bearings with individual syphone joints to remove the condensate from the interior of the cylinders. These dryers operate with less power and higher steam pressures than older types. Regulators are available whereby surface temperatures of the cans may be automatically controlled and adjusted to meet special requirements.

The use of larger, more efficient slack dryers is resulting in increased production both in drying and curing operations. Refractory burners are being used with conventional type dryers to speed production. This is particularly true on tenter dryers where these burners have been widely adopted and are receiving very favorable comment from finishers. Infra-red lamps are also in use for this purpose, but have not found as much favor as the gas-fired burners.

FINISHING

In rayon finishing, the trend has been toward finishes which are quite permanent through the normal life of the fabric. Among the finishes of this type which are worthy of mention are anti-crease resins, durable water repellents, permanent softeners, alkali cellulose compounds and permanent dullers. These finishes are widely used and have come to be everyday tools in the hands of modern finishers.

Considerable yardage of rayon fabrics are being delivered with low residual shrinkage and fast colors. These fabrics are being finished practically to specification so that they may be made into shirtings, dresses, etc., which will give satisfactory results even when laundered in a manner similar to cottons. Vat dyed rayon shirtings have been produced in which the residual shrinkage is held under one per cent. It has been found that shrunk rayons can be stabilized through the care-

ful application of urea formaldehyde or melamine resins. In practice, about fifteen per cent of urea formaldehyde in the fabric is found to give the desired stabilization result in combination with anti-crease qualities. Several plants have succeeded in obtaining low residual shrinkage through the use of resins followed by Sanforizing.

The American consumer is definitely quality conscious and will continue to be rewarded with improved results from the rayon dyers and finishers. Popular education in quality is being furnished to consumers through the publicity programs of such organizations as The Good Housekeeping Institute, The American Institute of Laundering, The American Association of Textile Chemists and Colorists and various manufacturers of synthetic fibers. These agencies have established certain minimum requirements of serviceability for the various categories of rayon fabrics. Thus the rayon processor is kept continuously at the task of maintaining rigid control of all operations, and ever awake to new developments which will add to the quality of his product.

Reconversion—

(Concluded from Page 493)

spend its quota dollars—whether for good dyes or a larger amount of cheap dyes. Their decisions may at times have caused dissatisfaction with American dyestuffs on the part of the public but were entirely outside of any influence or control which dyestuff manufacturers had at their disposal. Anthraquinone dyes present a somewhat different picture. They include the fastest colors for cotton and wool and were in heavy demand for uniform fabrics. Nevertheless, at no time during the war were they not available for necessary work clothing and other purchases qualified under Conservation Order M-103. The choice to purchase these fast colors within legal limits was made use of by our better mills; those who did not, exercised a free democratic option in the matter but the shortage of fast dyed fabrics was not the fault of the chemical industry.

From the foregoing it appears that the dyestuff industry's chief reconversion obligation is to itself; to bring its equipment up to date and to expand its manufacturing facilities along predetermined lines. No radical developments are expected; no "atomic" creations are in prospect. Well timed, adequate manufacture of well-known dyestuffs in accordance with the new market requirements is the industry's program. New dyestuffs will be brought out as opportunity permits — many of which will be duplicates of those formerly imported. Postwar reconversion does not envision a radical transformation of the dyestuff industry; this is neither possible nor required.

Resins—

(Concluded from Page 507)

for thermoplastic resins. Better bonding (higher weight retentions through washing), maximum hand, least tack, best abrasion, etc., are obtained after running through the curing temperature.

The monomers of thermoplastic resins of interest for textile application usually contain one or more double bonds or unsaturations which are capable of reacting. Thus one molecule adds to another in chain fashion and a true addition polymerization occurs. (As stated above thermosetting resins increase in complexity and in size by undergoing chemical condensations accompanied by the loss of water, alcohol, or formaldehyde). The commonly used thermoplastics (see Figure 2.) include the various vinyl compounds, natural and synthetic rubbers and esters of acrylic and methacrylic acids. There are many other thermoplastics which have not yet shown much promise in the textile finishing field.

Thermoplastic resins often can be made thermosetting by reacting with a chemical such as formaldehyde or sulfur and "vulcanizing." Thus, cross linkages are obtained and the resin will resist thermal deformation. Obviously such resins cannot be considered thermoplastic even though their original chemical configuration was representative of thermoplastics.

Many thermoplastic resins can be depolymerized to the monomeric stage by the use of sufficient heat. Often this depolymerization is complete but usually tar formation occurs preventing 100 per cent yields. The data indicate that thermoplastic resin polymerization is a thermally reversible reaction; thermosetting resin condensation is a thermally irreversible reaction.

Practically no thermoplastic resin dispersion yields shrinkage control or crease resistant finishes. (Speakman[2] utilizes thermopolastic resin monomers in very high concentration under commercially impractical conditions to obtain wool shrinkage control and two American processes use vulcanizable natural or synthetic rubber latices also to obtain wool shrinkage control). Their main function is to impart desirable wash resistant soft or stiff handle, good drape, good tensile strength and increased abrasion resistance. The latter property should prove of most importance in the future. Unfortunately, because their marked importance during the war as plastic materials required all production be used for this purpose, very little mill run data is available on the commercial importance of textiles finished with thermoplastic resin dispersions. The indications are that this knowledge void will be filled extremely rapidly.

It is obvious that a variety of useful effects can be obtained by simultaneous use of thermoplastic and thermosetting resins. Also resins alone and in combination can be applied along with starches, gums, softeners, natural resins, etc., in order to obtain unique and desirable finishes. Pigment printing is one potentially great field for such blends of correctly chosen ingredients. While the optimistic predictions of an imaginative press may take some time in being achieved, chemicals and resins are available to tool an ever-improving functional textile wearing apparel and house furnishing industry.

REFERENCES

[1] Rabold, C. N.—Textile World 95, page 93, March 1945.

[2] Speakman, J. B. and Barr, T., British Patent 559,787.

FIGURE 2

COMMON THERMOPLASTICS AVAILABLE FOR TEXTILE APPLICATION

TYPE	BASIC FORMULA		COPOLYMERS COMMONLY AVAILABLE AT PRESENT
ACRYLIC ACID ESTERS	$R\text{-}O\text{-}\overset{O}{\overset{\|}{C}}\text{-}\overset{H}{\overset{\|}{C}}=CH_2$		MIXED ESTERS (ETHYL AND METHYL) ALONE OR MIXED WITH METHACRYLIC ESTERS
METHACRYLIC ACID ESTERS	$R\text{-}O\text{-}\overset{O}{\overset{\|}{C}}\text{-}\overset{CH_3}{\overset{\|}{C}}=CH_2$		AS ABOVE
ACRYLONITRILE	$H_2C=\overset{H}{\overset{\|}{C}}\text{-}C\equiv N$		BUTADIENE TO GIVE BUNA N RUBBER
BUTADIENE	$H_2C=\overset{H}{\overset{\|}{C}}\text{-}\overset{H}{\overset{\|}{C}}=CH_2$		ACRYLONITRILE + BUNA N RUBBER STYRENE + BUNA S OR GRS RUBBER
CHLOROPRENE	$H_2C=\overset{Cl}{\overset{\|}{C}}\text{-}\overset{H}{\overset{\|}{C}}=CH_2$		
ISOPRENE	$H_2C=\overset{CH_3}{\overset{\|}{C}}\text{-}\overset{H}{\overset{\|}{C}}=CH_2$		NATURAL RUBBER
STYRENE	$\bigcirc\!\!-\overset{H}{\overset{\|}{C}}=CH_2$		BUTADIENE + GRS
VINYLS	$H_2C=\overset{H}{\overset{\|}{C}}\text{-}OH$	ALCOHOL	TOGETHER TO OBTAIN A VARIETY OF EFFECTS
	$H_2C=\overset{H}{\overset{\|}{C}}\text{-}Cl$	CHLORIDE	" " "
	$H_2C=\overset{H}{\overset{\|}{C}}\text{-}O\text{-}\overset{O}{\overset{\|}{C}}\text{-}CH_3$	ACETATE	" " "

REACTIONS: $R_2C=CR_2 \rightleftharpoons R_2\text{-}\overset{\vdots}{C}\text{-}\overset{\vdots}{C}\text{-}R_2$

Problems for Future Quartermaster

TEXTILE RESEARCH*

LT. COLONEL S. J. KENNEDY, QMC

At the start of the research program initiated after the formation in 1942 of the Research and Development Branch of the Office of The Quartermaster General, the problems in the field of textiles which demanded immediate solution were basically physiological. It was necessary to find out a great many things about clothing, which comprises the largest use of Quartermaster textiles, that had never seriously concerned our industry in the past. We had to know what types of clothing were best for men who had to live and fight out of doors for many days on end in the Arctic, in desolate mountain areas, in deserts, or in the steaming jungles; how we should design them and how much protection constituted the essential minimum for fighting efficiency.

The textile and clothing industries did not have the answers to these questions. The people, who have to live or work out of doors under extreme climatic conditions, constitute an important textile market; but except for recent fabric developments for winter sports clothing, little interest had been shown on the part of the textile industry in research in this field.

The research program which this Branch undertook embraced a broad field that had never before been subjected on an integrated basis to thorough, controlled laboratory and field tests. It would take as much time as is being given to this entire meeting to begin to do justice to the scientific work in the study of military clothing which has been carried on during the war. We should have to include the physiological and climatic studies undertaken in our Climatic Research Laboratory at Lawrence, Mass., the work done at the Harvard Fatigue Laboratory, the University of Indiana under Dr. Sid Robinson, and other private and university laboratory as well as extended field tests in all climates and terrains.

From these extensive studies, the scientists learned for the first time how to clothe man properly to live and fight effectively under extreme climatic conditions. Much of what we now know has been laboratories as well as extended field tests ing. As a result, the combat uniforms of the American Army today are the product not only of testing by Army Service Boards, as well as extended field tests, but also have back of them an unparalleled body of scientific research.

A great deal of what the physiologists have told us about military clothing is concerned with clothing design, a subject which is traditionally of very little interest to the textile industry. That such has been the case is indeed most unfortunate since actually textiles and clothing are two aspects of the same problem and no significant research in textiles can long be divorced from research in clothing. It might be stated that frequently a greater improvement has been made by changing the design and fit of clothing than by improving the functional performance of fabrics. It has been from this study of military clothing that we have obtained for the first time an adequate statement of the required characteristics for military textile fabrics.

Our research in textiles, that is in fibers, fabrics, and finishing, has been characterized first by what may be considered as applied research or development. Existing items have been subjected to continuous improvement either by raising the level of specification performance or adopting an improved fabric construction, or requiring a new finishing treatment.

It has not been possible, however, to find satisfactory solutions for all of our problems in this way. Those of us who have guided the research and development program of the Quartermaster Corps have been increasingly concerned as the war has progressed with fundamental research problems in the field of textiles. We are to discuss here today ten such areas of research which must occupy the attention not only of the military services but of the industry itself if significant advance is to be made toward further improvements in military textiles, and, for that matter, civilian textiles as well.

The first fundamental research problem which I wish to present to you is that concerned with the improvement of fabrics with respect to water-resistance.

IMPROVEMENT OF FABRICS WITH RESPECT TO WATER-RESISTANCE

As far back as one cares to go, armies have fought in wool clothing. Perhaps this was due to the universality of wool, to the fact that among almost all peoples of the world, wool furnishes the basic material for clothing. But wool also has the advantage that because of its resilience, it is a good insulator and people can keep warm in wool garments.

The draw-backs in the use of wool in the outer garments of soldiers have never seemed to weigh heavily upon the minds of tradition-bound military or textile men. The fact that due to the nature and construction of wool fabrics they are not resistant to biting wind and that wool has the further property of absorbing large amounts of water have been overlooked.

These factors, however, have counted heavily in all of the physiological studies which we have made of military clothing, particularly in winter or cold climate clothing where wool has traditionally been used. Penetration of wind through the clothes chills the skin and lowers the body temperature. Wet clothing is also a hazard, since water is a good conductor of heat as contrasted with still air which permeates the resilient structure of wool fabrics and makes them such good insulators when dry. To evaporate the moisture in wet clothes body energy must be expended. When a man is at rest, lying in a foxhole or sleeping, he may not generate enough body heat to do this with resulting lowering of body temperature, loss of efficiency, and danger to health.

The abandonment of wool in outer garments of Army combat clothing has been one of the most important changes in military textiles during the war. The fact that our overcoat itself weigh 7 lbs. and can absorb in a moderately heavy rain an additional 9 lbs. of water was one factor contributing to this change. Most important, however, was the fact that lighter weight cotton textiles, showed themselves to be far superior in wind and water resistance in all controlled laboratory and field tests as well as in actual combat. By making this substitution, wool could then be relegated to its real task of providing insulation in under layers of clothing beneath the outer cotton water-resistant garments. There it could be kept from getting wet from the outside while body moisture could be transpired through the outer fabric.

* Delivered at Conference on Quartermaster Textile Research, National Academy of Sciences, Washington, D. C., October 25, 1945.

Furthermore, these cotton water-resistant fabrics have other desirable functional characteristics not possessed by wool. They are stronger, more resistant to tearing, they dry more quickly and after they have been used in the grime of battle, they can easily be washed even under the most primitive laundering conditions. Their water-vapor permeability permits adequate transpiration of body moisture to the outer air even in the most densely constructed fabrics of this type.

At the start of the war the development of water-resistant fabrics was concentrated upon improved water-repellent treatments. This arose in part from the continual development of new and better products by the chemical industries and in part because the importance of fabric construction in keeping the soldier dry had not been fully appreciated.

Fabrics of the wind-resistant, water-repellent type stem from the initial development of Grenfell cloth, an English fabric developed for Arctic exploration, and its American counterpart, Byrd cloth, which was used by the Byrd South Pole Expedition. They are fine twills made with 80/2 combed warp and filling. Since the amount of these fabrics that could be produced by American industry was limited, alternates had to be developed if the Army as a whole was to be equipped. The fabric initially selected for this purpose, after tests of many alternate constructions, was the wind-resistant poplin, slightly heavier in weight but with comparable water resistant properties. Subsequently, when a tougher, more tear resistant fabric was deemed necessary, the 9 oz. wind-resistant sateen was adopted.

During 1943, samples of English fabrics having better water-resistant properties than any heretofore known in this country were received in our office through military channels. Initial attempts to duplicate the fabrics in this country were unsuccessful and further detailed information was accordingly obtained from England.

The basic principle of construction of these fabrics was worked out by Dr. F. T. Peirce, formerly of the Shirley Institute and now Director of Research in the Textile School, North Carolina State College. A very dense fabric with a high warp cover was constructed, using an oxford weave to permit laying in a very large number of warp ends. The swelling properties of the cotton when wet then closed up the fabric and reduced the penetration of water.

Several fabrics employing this principle of construction were adopted by our office which have been procured in large quantities for use in winter combat clothing and related items. Recently the 9 oz. wind-resistant oxford has been adopted as the standard fabric for winter combat clothing in place of the 9 oz. sateen.

We do not consider, however, that these fabrics represent the ultimate in water-resistant fabric development. It is quite evident that a great deal more needs to be learned about the construction of this type of fabric and we are not at all sure that the principles of construction and finishing which we are presently employing are capable of producing the fabric that is required. In the first place, the effects of the swelling of cotton fibers upon the performance of water-resistant fabrics are certainly not adequately understood. A broad study in this field has been initiated by The Southern Regional Laboratory of the U. S. Department of Agriculture upon the request of our office to extend studies previously made and to include the following lines of research:

1. Development of precision techniques for the direct measurement of swelling, including changes in length as well as in section dimensions. Application of tension to fibers during the study of swelling properties.
2. Measurement of rate and extent of swelling, and determination of effect of such factors as pH, cyclic wetting and drying, fiber structure, non cellulosic content, and finishing, and water repellent treatment on them.
3. Measurement of forces involved in fiber swelling.
4. Study of surface physics and chemistry of fibers.
5. Correlation of precision measurements with more readily measured properties, possibly on yarns or fabrics.

Because of its unique responsibility for fundamental research in the field of natural fibers, it is considered particularly appropriate that this work should be undertaken by the Department of Agriculture.

In addition to the basic study of this important physical characteristic of cotton fibers, a research project is now under way at the Institute of Textile Technology to develop unequivocally the principles of design of water-resistant fabrics. Four series of fabrics are now being prepared for careful evaluation of the effect of variations in fabric constructions, holding cover factors constant in one case, tightness constant in another, constant warp-cover-factor and constant weft-tightness in another. Certain variations in weave are being included as a further series.

It is also planned to evaluate the efficiency of water-repellent agents at various stages in textile processing from the untwisted fiber through the woven fabric. This will include the study of the rate of degradation of water repellency in an effort to understand this phenomenon as it occurs in cotton fabrics. A fourth phase of this study will involve the determination of the principles influencing transmission of liquids through fabric structures.

Beyond this fundamental study of physical properties of fibers as used in water-resistant fabrics, further research is needed for the development of improved water-repellent agents. Our water-repellent finishes today are far better than are those obtainable at the start of the war. Much better ones, we believe, can be developed. The Germans have a whole new range of hydrophobic materials for textiles in a new group of organic compounds derived from ethylene urea. We, in this country, have the promise of important developments in the field of silicone chemistry, a unique group of hydrophobic materials, which when we learn to apply them successfully, may be an ideal type of material to apply to water-resistant fabrics.

Development of water-repellent chemical agents has been regarded by our office as basically the responsibility of chemical manufacturers, who, in their desire to develop improved chemical agents on a competitive basis, have carried on intensive research in recent years, both before and during the war. If such research continues to be productive in meeting our severe requirements of field use and laundering, our fundamental research can be centered upon physical studies of the properties of fibers, yarns and fabrics and the evaluation of such new water-repellent agents as industrial research produces.

Possibly the solution to this problem of water resistant fabrics will have to come ultimately from outside the textile industry. There is at least a possibility that manufacturers of plastics may find a material which has all of the important properties of conventional woven textiles and some other desirable properties besides. Some plastic films already developed have the necessary impermeability to water and give promise of having satisfactory water vapor permeability. These films are amazingly tough and even today are cheaper than cloth. The plastic industry, which is admittedly only in its infancy, has a tremendous research program and, under the impetus it has received during the war, can be expected to make definite progress in lines parallel to textiles in years to come.

IMPROVEMENT OF MILITARY WEBBING

Webbing used for the personal equipage of the soldier has this in common with the outer clothing of the soldier that has just been discussed: in a drenching rain it will absorb an excessive amount of water, adding as much as 5 lbs. to the load on a soldier's back. In any climate, but particularly in the hot humid types, every ounce of added weight demands a toll from the soldier even when he is only moderately active. The extra load which water absorbed in his webbing equipment

forces upon him, means that he can carry just that much less payload or be subjected to a proportionate reduction in his efficiency. The solution of the average soldier to this problem is to throw his equipment away when it feels too heavy, despite the importance which it may hold for his efficiency and safety.

It has already become clear that conventional types of water repellents do not provide a satisfactory solution to this problem. They result in a permanent add-on of weight which the man must carry all of the time. Furthermore, a considerable part of the added water is held mechanically in the coarse fabric rather than in the fibers or yarns, upon which a water-repellent treatment has no effect.

To study this problem of reducing the weight of a soldier's webbing equipment, a research project has been set up under the National Academy of Sciences at the Rhode Island State College. A complete restudy of webbing construction and materials as well as means of reducing water-absorption is being made.

It has already become clear from a preliminary study of the use of webbing for Quartermaster items that many of the principal uses have distinct functional requirements of their own. In some uses, high resilience is important, in others resistance to abrasion, and in still others, strength, stiffness, flexibility or low elongation are needed. The twelve distinct uses include handles, shoulder straps, binders, reinforcing and adjusting straps.

While redesign and reconstruction of cotton webbing may provide a partial answer to the over-all problem, it is apparent that there are excellent opportunities in this field for the use of some of the synthetic fibers. Such fibers as nylon and saran (vinylidene chloride), for example, are inherently non-water-absorbent and there are new types of fibers now under investigation which have similar properties. Since in webbing there are the three variables: the warp yarn, the stuffer yarn, and the filling yarn, manipulation is possible in all three to obtain the desired properties in the end product. It is quite possible that the ideal webbing for many military uses will be found to be a three-fiber webbing using the proper fibers in the proper yarn size, twist and plies in each of these three places in the webbing.

Other approaches to the problem are coating or laminating of cloth with plastic or rubber compounds and then cutting to size. Procurement was being made of webbing of this type in substantial volume at the end of the war. New advances in coating of glass cloth also hold considerable promise of adapting this fiber to use in webbing.

Here, as with water resistant fabrics, there is a possibility of finding the ideal solution entirely outside of the textile industry. With the further improvements in strength and notch resistance of plastic films of the type already sold commercially in suspenders and garters, materials of this type may ultimately replace textile webbings in military uses.

IMPROVEMENT OF EQUIPMENT FOR SLEEPING IN THE FIELD

Sleeping gear presents one of the most interesting research problems in the whole textile field because of what appears to be a basic contradiction in military requirements. We must on the one hand have bulk in which dead air can be trapped to give the required insulation, while on the other hand bulk must be reduced to the minimum in order that the man can carry his sleeping gear on his back and have it with him when he needs it. This contradiction in requirements can be resolved in the statement that a satisfactory sleeping bag filling material should roll up to a minimum bulk on a man's back, but have high bulking value when unrolled. In addition, it must be launderable, durable under repeated load, have high resilience, low thermal conductivity and minimum weight, and retain its bulking value after laundering.

Of the more than forty different filling materials for sleeping bags which have been tested by our office in our search for a material available in large volume, none has been found which equals the properties of water-fowl down and feathers.

Early in the war when we were concerned with the problem of protecting men in extreme cold, when the Alcan Highway was being driven through to Alaska and there was an urgent requirement for equipment which would enable men to fight under Arctic conditions, we had to find something which would enable a man to get a night's sleep under such extremely cold temperatures as forty degrees and sixty degrees below zero. We also had to provide something for troops who would be fighting in mountainous areas where, if temperatures may not have been as cold, every unnecessary ounce had to be eliminated from the man's back because of his greater dependence upon manpacking as the basic means of supply. For the rather limited quantities of sleeping gear required for troops such as these, it was possible to provide sleeping bags filled with water-fowl down and feathers in the 40/60 dilution which was adopted early in the war as giving the most efficient use of the down.

However, when it came to providing adequate sleeping gear for the very large number of soldiers who perhaps would not have to sleep in below zero temperatures for any length of time but whose normal winter temperature at night would be from somewhat above freezing down to zero, the problem was a great deal more difficult. Our wool sleeping bags represented a more efficient use of the weight and bulk of wool blanketing materials than the blankets themselves—in fact, controlled test reports indicated that we obtained practically the efficiency of two blankets in one wool sleeping bag made from the blanketing material. But even two wool sleeping bags did not provide the necessary insulation for six hours of sleep even when dry at below-freezing temperatures.

Since it is improbable that in any future emergency the duck population of this country will be sufficiently larger than during this war to provide larger supplies of water-fowl down and feathers for this use, it is most desirable that some more satisfactory insulating material be found.

From our research it appears highly improbable that it can be found in any of the natural fibers or filling materials. There is reason to believe, however, that developments in the field of synthetic fibers will ultimately produce a satisfactory fiber for this purpose. As a matter of fact, the most promising material presently being tested is Fiberglas. Possibly also some means will be found for making a durable inflatable sleeping bag of very light weight which can readily be inflated to give the insulation required.

As with winter combat clothing, the problem of water in sleeping bags is particularly acute. The possibility of using water-proof coated fabrics in an outer case has been carefully explored, but while it may protect against water from the ground, it creates the other hazard of water accumulation in the bag, resulting in increased weight and ultimately in a great reduction in insulating value. For an outer case on sleeping bags we have again used water-vapor-permeable, water-resistant fabrics which, as already pointed out, need further improvement. As long as soldiers in combat must sleep out in the open, the Army will need to continue its research to develop sleeping gear which will be light and of minimum bulk and yet will enable soldiers to keep warm and obtain the rest they must have if they are to fight efficiently.

IMPROVEMENT OF SHELTER IN THE FIELD

In tents we have the old problem of water again, this time combined with two other serious problems—the decomposition of cellulose by the action of the rays of the sun, and by attack from micro-organisms. There is the further critical hazard of fire in personnel and hospital tents under the threat of incendiary attacks from the air, where a few seconds of time may make the difference between life and death.

We have learned a lot about tents during the war, in part because not very much was really known about them before the

war, and in part because of the severity of the conditions to which they have had to be exposed in the tropics where degrading influences are the greatest. A great deal has been learned about how to finish tentage fabrics, perhaps the most important fact being that this art is still in its infancy. Considerable has also been learned about fabrics for tents and about tent construction. It can be said today that we can make tents which are far more durable than any that were produced during the war, and are more resistant to leakage and lighter in weight.

Because the testing of tents and tentage fabrics and finishes is necessarily a long process, requiring extended exposure to the elements, some of our conclusions will have to await completion of tests which are now under way. Perhaps the most important of these is the large scale exposure test at the Quartermaster Board at Camp Lee. There, more than one hundred tents representing different variations of fabrics, finishes, designs and constructions have been pitched in an exposure area where they will remain from one to three years. Panels of the same fabrics have been exposed adjacent to the tents so that determination can be made of the influence of structure form as well as of the atmosphere in the performance of the fabrics used in tents.

A most important aspect of this test from the standpoint of the textile industry is the extensive work being undertaken in collaboration with scientists from the astrophysical laboratory of the Smithsonian Institution in the measurement of the amount and character of solar radiation which these tent fabrics will receive. In the past, exposure testing of fabrics has been limited simply to notation of hours of sunlight or the days exposed and relating the data to changes in the fabric properties. This test has been organized so that the influence of not only amount but kind of radiation on the degradation of fabrics will be evaluated.

Tent design and construction is being studied by personnel of the University of Louisville Institute of Industrial Research under a research project sponsored by this office and conducted under the auspices of the National Academy of Sciences. The principles of tent construction in relation to adequate distribution of loads, structural stability and temperature control are being developed in this work.

Industrial research in the field of tentage will depend to a considerable degree upon the findings from current tests. Analysis of the fabrics now on exposure at Camp Lee should indicate constructive lines of research in textile fiber and finishes as well as indicating how light in weight it will be practicable to go in fabrics for tents employing the improved construction which has now been adopted. What is learned about fabric construction from the basic project on water-resistant fabrics can also be applied to tentage fabrics. It appears at present that plied yarn duck will never again need to be used for Army tents, that lighter weight single yarn fabrics far more available in an emergency, will not only be adequate but better from the standpoint of water-resistance than the heavy plied yarn ducks which were standard during the war. From the study of the effects of solar radiation upon exposed tents, it should be possible to find a way to introduce some material into the finish which will reduce the severity of attack in the same way that fungicides are used to prevent attacks by micro-organisms.

SHRINK RESISTANT TREATMENT OF WOOL ITEMS

It may be pointed out that the American wool industry was simply not prepared at the outbreak of the war to deal with the military necessity of washing wool items in place of dry-cleaning them. In this respect, they were far behind the British wool manufacturing industry which has been able to provide the British Army throughout the war with shrink-resistant wool items. We had been content with talking about a mild washing formula for wool without facing the fundamental necessity of altering the physical properties of wool so that it would withstand washing under field conditions.

From the results obtained to date by the research program on the shrink-resistant treatment of wool which was started by our office with The Textile Foundation under a contract from the National Research Council and which is now being continued by the Milton Harris Associates, it may be stated that had the war lasted another six months we should have been procuring at least a portion of all of our wool items processed with a shrink-resistant treatment and, within a year, such a treatment would have been made a specification requirement for every wool item. The savings to the Army already made on the completed part of the program has been more than enough to pay the cost of any research program on Quartermaster items which has been contemplated at any time during the war.

The value of this research to the wool growers and the wool manufacturing industry of this country will also be widely recognized. Regardless of its important peacetime applications in securing new markets for wool or preserving old markets against competition from other fibers, within the Quartermaster Corps it is regarded as only the first step towards a fundamental restudy of military wool clothing. Further research will involve a complete restudy of fabric construction and garment design to take full advantage of the changes in physical properties of the wool and the fabrics resulting from this treatment.

IMPROVEMENT OF ABRASION RESISTANCE OF TEXTILES

In speaking of the improvement of abrasion resistance of military textiles, it may be worthwhile quoting a statement which a certain mill president made to us in regard to this project to the effect that the textile industry does not want to make fabrics which will wear longer, that it wants to make fabrics which will wear out quickly so that people will have to buy more of them. If that view is widely held in the textile industry—which I doubt very much to be the case—then perhaps a lot of people in our industry would do well to study what research to make better products has meant to other American industries.

Such an attitude is certainly alien to the public's point of view which we, who specify what will be bought with the public's money, must have. We are definitely interested in learning how to make fabrics and items made from them wear longer. If we could just have improved the wear resistance of our clothing and textile equipage so that it would have lasted 10 per cent longer, other thing being equal, a saving to the American public of more than twenty million dollars per month could have been made last year.

There have been technical problems as well as limitations as to available funds which have stood in the way of extended civilian research on the wearing qualities of textiles. The Army's stake in this field, however, is so great that the necessary program of fundamental research into the nature of abrasion of textile fabrics and of ways to reduce the effect of wear by construction changes or improvements in finishing processes, can be justified many times over.

The implications of this project to Quartermaster operations on textiles is very great indeed. When we understand more fully how wear occurs on fibers, yarns and fabrics and what the effects of various types of finishing treatments may be, it should be possible to reconstruct our fabrics fundamentally so as to obtain the maximum wearability consistent with with functional requirements. We in the Quartermaster Corps believe that consumers in the civilian economy will also be interested in the application of the results of these studies to the textiles which they buy.

TREATMENT TO RESIST TROPICAL DETERIORATION

The progress which has been made by the Army in the study of tropical deterioration, particularly by the Quartermaster Corps in the field of cellulose degradation,

will easily rank as a major scientific achievement in the field of bio-chemistry.

There is no denying that the losses in Army material in early Pacific operations were enormous. Experience with the relatively slow rates and infrequency of attack by micro-organisms in a temperate climate was not adequate preparation for the effects of humid tropical jungles of New Guinea. From the study of microbiological flora in various parts of the world, we now have at least partial answers to a great many questions such as: "What organisms are responsible for degradation?"; "Are the same organisms involved in widely separated tropical areas?"; "Do they appear in any particular order as exposure is prolonged?"; "Which micro-biological flora are actively present at the period of greatest rate of loss of tensile strength?"; as well as questions on the sensitivity of cellulose-destroying bacteria to the presently used cell toxicant type of fungicides.

The value of this work to military textiles will be immediately apparent. Its significance in civilian textiles will, undoubtedly, come to be recognized as the extent of the losses to consumers even in this country from attacks upon textiles by micro-organisms are more fully appreciated.

IMPROVEMENT OF SEAMS IN MILITARY CLOTHING AND EQUIPAGE

Seams constitute one of the least satisfactory elements in military clothing. Early in the war the problem of inadequate seams on waterproof clothing and raincoats arose at the time when it was necessary to change from rubberized waterproof materials to materials treated with synthetic resins. The impracticability of joining such materials with sewn seams was clearly brought out by the failure of the needle holes to close. As a result it was found more satisfactory to join such materials with cement than to use conventional sewn seams. A somewhat simi'ar problem still exists on winter combat clothing and equipage made from water resistant fabrics such as the high sley oxfords and other water repellent fabrics.

The improvements in fabrics and finishes which have been made as a result of continuing research in the field and are currently being extended, have not been matched by corresponding improvements in seams. Water seepage and wicking of water at seams represent a far lower standard of water resistance than is provided by the rest of the garment. Accordingly, further improvements of fabrics and finishing agents must be paralleled by research to improve seam construction to bring seams to at least a corresponding high standard of performance.

Furthermore, a large proportion of failures in Army clothing and equipage occur at seams. For example, wool clothing salvage studies made in 1943 showed that stitching failures appeared in 59 per cent of the garments studied and were more numerous than any other single type of failure with the exception of frays. On wool trousers, stitching failures appeared in 66 per cent of the garments. They were not limited to wool garments, since on shirts, cotton, khaki, they appeared in 42 per cent of the entire samples studied and in 27 per cent of trousers, cotton, khaki.

Seams in textile clothing and equipment constitute one of the few textile areas where the Quartermaster Corps has accepted commercial practice. Its inadequacy in meeting military requirements has been thoroughly demonstrated. It is probably just as inadequate on civilian articles but it does not appear that either the garment industries or consumers have tried to do anything important about it.

During the war, with continual pressure to turn out enormous quantities of clothing, there seemed little that could be done to improve this situation. However, a long range study of the basic factors involved is planned as a major post-war research project. Part of this research will be directed toward the use of adhesives in place of sewn seams. The properties of specialized adhesives have improved so much during the last few years that adhesives are now available which have a bond strength from fa'ric to fabric strong enough to tear the fabric. In some items it may accordingly be possible to eliminate the present unsatisfactory methods of joining fabrics using thread and sewing machines. The manufacture of canvas paulins with cemented seams has already shown considerable promise and tents made with cemented seams are now on test.

EVALUATION OF NEW MATERIALS AND PROCESS FOR MILITARY USE

Most of you in the textile industry have thought of the Army in the past largely as a testing agency to evaluate your new products for possible military application. Unquestionably this work of the Quartermaster Corps is important. During the war it has been intensified by the emphasis which the winning of the war has had in the textile industry. On our part, as reports of combat experience and data from extended field tests have been received, functional requirements have become more clearly defined so that it has been possible to evaluate better the relative merits of different products and development ideas su'mitted by industry.

Testing and research have shown a number of important new applications for synthetic textiles. The record will show many similar developments in other lines which have been initiated by industry and brought to the Quartermaster Corps as possible answers to our needs. In some instances, they could be adopted at once; others have not been found to have military application; whereas still others could be used only after extensive modifications had been made. We are glad to be able to acknowledge that a great deal of the progress which we have made in the improvement of Quartermaster textiles has come from research and development in commercial firms.

It may be suggested that a broad approach to Quartermaster textile needs will be desirable in view of the rapidly accelerating pace of technology within the textile field today. Some of our problems can be solved by utilizing existing fibers with greater efficiency; by finding the best possible construction and design of fabrics which can be made from these fibers. Further advances will be made by the treatment of existing fibers either to obtain fundamental modifications in their molecular structure, or by impregnating them with various types of materials or surface coating them in any one of a great many ways. Still further advances will be made with the development of more new types of synthetic fibers having the specific physical properties needed to meet a given use.

OTHER PROBLEMS FOR TEXTILE RESEARCH

The specific problems which have been discussed above do not by any means exhaust the field for research on military textiles. Little mention has been made of requirements for clothing by troops in the tropics, in jungles or desert areas where the physiological requirements are totally different than in temperate and cold climates. Perhaps the soldier would be much better off naked in the jungle, if humid heat were the only problem, but he must also be protected against mosquitoes and other insects, the sharp cutting vegetation, and the rays of the sun. Here lightness in weight is paramount, everything the man wears and carries costs a tremendous premium in exertion and exhaustion.

During this war, one of the most important research projects which we have undertaken has been the development of clothing for protection against gas warfare. Chemical treatments developed by Chemical Warfare Service for impregnating clothing, early in the war appeared to cause inexplainable deterioration of cotton fabrics. There were wide variations in the rates of deterioration with some mills producing very resistant fabrics while other mills' fabrics were particularly susceptible to such deterioration in storage. A painstaking study of all the detailed processes of finishing in all the textile finishing plants together with a laboratory investigation by the Textile Foundation under the auspices of NDRC finally indicated the fabric condition under which this type

(Concluded on Page 519)

ABSTRACTS FROM CONTEMPORARY JOURNALS

CELLULOSE STUDIES: I. REACTION OF OXYCELLULOSE WITH AQUEOUS ACIDS AND ALKALIES, Eugene Pascu, *Textile Research Journal*, page 354, Vol. XV, No. 10, October, 1945.

This paper represents a contribution from the Textile Foundation and the Frick Chemical Laboratory at Princeton University. Its contents are summarized by the author as follows:

1. It has ben pointed out that contrary to wide-spread belief, the aldehyde type of oxycellulose which structurally belongs to the semiacetals of glyoxal is not affected by treatment with cold acid to any appreciable extent.

2. It has been found that oxidation of periodate oxidized cellulose by bromine in sodium carbonate solution, followed by acid hydrolysis, gives rise to a 75 per cent yield of glyoxylic acid isolated as 2.4-dinitrophenylhydrazone.

3. It has been pointed out that the consumption of alkali by periodate oxidized cellulose is not due to carboxylic groups; it is caused by certain anionotropic and prototropic changes which may take place as competitive reactions.

4. Of the anionotropic changes the Cannizzaro type of reaction, previously found by other investigators, has been studied under modified conditions on the dialdehyde obtained by periodate oxidation of α-methyl-D-glucopyranoside.

5. In connection with the prototropic changes, a hypothesis based on the electron concept of valence has been presented to explain the easy cleavage by alkali of the C—O—C bonds of the aldehyde type of oxycellulose, and to interpret the ageing of alkali cellulose.

RESINS APPLIED TO TEXTILES, L. J. Sheps, *Canadian Chemistry and Process Industries*, page 546, No. 8, Vol. XXIX, August, 1945.

This is a paper presented at the Canadian Chemical Conference, held in Quebec on June 5th, 1945.

There are three broad methods covering the application of resins to textiles: (1) surface coatings, (2) deposition of resins from emulsified solvent solutions or from a specially prepared aqueous emulsion of formed resins, and (3) the introduction of resin formers or lower polymers within the fiber.

Surface coating has introduced the greatest variety of resins which are generally applied from a properly compounded solvent solution by dipping, spraying, knife-coating, or other means available to produce a uniform film over the goods. The resultant products are non-porous or practically so and include such items as shower curtains, seat covers, artificial leathers, etc. Among the resins and polymers used are: vinyl and copolyvinyl resins, the acrylates, the phenol-formaldehydes, the urea - formaldehydes, the melamine-formaldehydes, the esterified and highly etherified cellulose and carbohydrate derivatives, alkyd resins, and ester gums. The type to be used depends upon results desired and in some cases blends of two or more are used. Resins of manifold degrees of polymerization may give different characteristics in finishing. The resins may be used to treat yarn as well as the woven or knitted fabric. The resins may also be modified to carry pigments as dullers or coloring matter. These types of resins are also used in producing laminated fabrics.

Most of the resins used in method (2) are similar to those used for method (1). They are used, in one form, as water emulsions of the solvent dispersions. When applied (by doctor-knife or cotton back machinery or roller application) to the fabric, they do not form a total film, but permit air permeability. These emulsions are used to apply back sizing to carpets and cottons, slip-proofing of fabrics, and adhesives for laminating fabrics. Because of excellent bonding properties, they are used to fix pigments, starches and other finishes usually resulting in increased durability. Another form, the emulsion polymers, are of more interest from the textile point of view. They are made, in the absence of organic solvent or plasticizer, by the polymerization of the monomers or low polymers in the presence of certain emulsification and surface active agents, producing aqueous emulsions of the polymer. They can be utilized to give a variety of characteristics to textiles. They do not yield stiff fabrics but can furnish a clear, transparent, and pliable finish and still have certain bonding properties. Water-soluble and alkali-soluble cellulose ethers are also placed in this category. When alkali-soluble ethers are applied from caustic solution linen-like and glazed effects can be produced. Ether cellulose derivatives carrying color pigment and fungicides have been used to process army cotton marquisette netting.

One of the important applications of method (3) is the production of crease proofness. In regard to this the author says: "The announcement by Tootal Broadhurst Lee Company in 1928 of the results obtained by the use of urea-formaldehyde polymers to produce crush-proofness unlocked a new series of possibilities in resin applications to textiles. Here was a fabric modified by means of a resin, to an unusual degree, and yet nothing was visually present on the fabric. The method of obtaining this astounding effect, by impregnating yarn or fabric with the ingredients of the resin or a low polymeric form of the resin, and then causing resinification within the fiber by means of heat and (generally) a catalyst, was intriguing. As much as 30 per cent of resin can be incorporated into a fabric without altering its appearance." The uses of urea-formaldehyde, melamine - formaldehyde, hydrazine dicarboxylamide - formaldehyde resins and other amine - formaldehyde resins have been patented for use in shrink-proofing. Mention is made of the properties and available forms of melamine formaldehyde resins as compared to urea-formaldehyde resins. The use of these resins to obtain various results are mentioned, including the following: combination with starches, gums and pigments to obtain a specific hand or drape; color pigment applications; finishing to produce increased resistance to wet treatment; to enable the use of certain dyestuffs otherwise not applicable to the fabric; to produce better mechanical effects such as by embossing or calendaring; use of resins in combinations with other products to produce rot-proofing, water-proofing, etc.

The importance of fabric structure and design in regard to the application and effects of resins are discussed.

A bright future for the application of resins to textile is predicted. More extensive research and a more thorough understanding of resin chemistry and resin properties is desired. Increased color fastness to different agencies through the alteration of dyeing properties of yarns treated with resins and through the resin pigment padding process are possible. More and more textiles will undoubtedly be treated with synthetic resins.

SPECKY EFFECTS IN TEXTILE PRINTING. The Textile Manufacturer, page 390, No. 849, Vol. 71, September, 1945.

The main type of specky effects are dark colored specks resulting from any of three causes: (1) undissolved dyestuffs; (2) precipitated dyestuffs; (3) faulty dispersion of a paste dyestuff in the print color.

Dyestuffs which dissolve easily in water do not, as a rule, give specks. However, where a high percentage of dyestuff is present in the aqueous solution, speckiness may develop where heavy parts of a pattern are being printed alongside finely engraved parts. Specks, in a case like this, are usually white. To remedy this condition, it is suggested that additional

solvents may be used or the paste heated in a steam jacketed pan until solution is complete. A number of solvents and their application to the solution of various dyestuffs are listed. In addition to the use of solvents the following hints are given to avoid speckiness: (1) dyestuff solutions should be filtered before addition to the print paste; (2) where the dyestuff is dissolved in the hot thickening in a steam-jacketed copper pan, straining should take place after the color has been mixed.

Precipitation of dyestuff may occur (1) with basic dyes by careless addition of tannic acid; (2) as the result of concentration of print paste in the angle formed by the edge of the doctor blade and the surface of the copper roller; (3) by mixing one member of a class of colors with another member of the same class of a different chemical group. In the first case a certain amount of precipitation can be cured by carefully mixing in a further quantity of tannic acid or the use of a proper solvent. In the second case it is recommended that the edge of the doctor blade be cleaned with a solvent and a further addition of the solvent to the paste made. In the third case it is recommended that good results may be obtained if a separate paste of each color be made before mixing or by the use of a suitable solvent.

Poor dispersion usually results from poor grinding; this may be avoided in some cases by the use of special grinding mills. There are now available colors in a colloidal dispersion as well as very fine paste and powder forms which avoid to a considerable extent the problem of proper dispersion.

COLOUR, G. S. J. White and T. Vickerstaff, *Journal of the Society of Dyers and Colourists*, page 213, Vol. 61, No. 9, September, 1945.

This paper was presented as the second Mercer Lecture at a meeting of the West Riding Section of the Society of Dyers and Colourists held at the Midland Hotel, Bradford, on April 30th, 1945.

While the term "color" covers a range of sciences it is used in the present paper only in connection with items of general interest or which bear most closely upon dyeing. The paper is divided into three sections: the light source, the colored object itself, and the observer.

The Light Source—The universal source of light is the sun and the history of artificial light is one of continual development from yellower light to bluer—from the candle to the daylight lamp. Filament lamps and vapor discharge lamps are discussed. An item in regard to the use of fluorescent tubes in the U. S. is of interest: "Special pink and yellow tubes have been produced in the United States for lighting in restaurants and places of entertainment, and these are stated to produce a sensation of warmth, to render the appearance of food more appetizing, and to be more flattering to the human face!"

As regards artificial light sources for color matching, the paper reports: "In 1931, an international commission on illumination, known in this country as the Commission Internationale de l'Éclairage (C.I.E.), laid down a specification for three light sources which were termed illuminant A, illuminant B and illuminant C, corresponding, respectively, to artificial light, noon sun-light and north sky-light. The adoption of one standard light would go a great way towards easing the dyer's color matching problem and it is rather unfortunate that illuminants B and C were both adopted. The reason was that the British and American representatives could not agree on the best definition of daylight, the British preferring the redder illuminant B and the Americans illuminant C. The great amount of colorimetric work carried out in the United States has been based mainly upon the use of illuminant C, and Hardy's *Handbook of Colorimetry* contains tables for easy computation of colorimetric results which are based on illuminant C only. In recent years, the work in the United States of Nickerson and others has suggested that an even bluer light than illuminant C is desirable for color matching, whilst even in this country a committee of the British Standards Institution has drawn up a specification for daylight lamps in which illuminant C is taken as standard. It seems clear, therefore, that the use of illuminant B is doomed."

The Colored Object—The spectrophotometric measurement of color is discussed. Reference is made to the photoelectric recording spectrophotometer developed by Hardy. It was stated that none of these instruments were available for measurement in England. The Snow Duplex Spectro-reflectometer is also discussed and the authors conclude the section by stating "that great developments in the electrical and photoelectrical measurement of color may be anticipated with complete confidence."

The Observer—The physical structure of the eye, and its use in color perception is discussed at some length. Considerable space is given to color blindness and methods of testing for it. Color matching by various systems of measurement is also covered.

In conclusion attention is drawn to the many references to American work in the field of colorimetry, and to the few of British workers. "It must be admitted, without dispute," the authors state, "that in the field of colorimetry proper, and particularly in the application of colorimetry to practical problems, the Americans are pre-eminent. In this country we are lagging behind in the application of a very valuable tool for the study of problems encountered in dyeing and coloring, and if this discussion stimulates anyone to take up this subject it will have served its purpose."

DYEING PROPERTIES OF WOOL WHICH HAS BEEN EXPOSED TO LIGHT, H. Roesti, *Melliand Textilber.*, 1943, *24*, 316-321, through *Brit. Chem. Abs.*, 1945 BII, 109.

Wool gabardine washed with Ultravon W and exposed to sunlight under glass in the absence of impure air for two summer months loses hydrogen sulfide due to decomposition of the cysteine in wool. On boiling with water, the resulting products and other reactive constituents of keratin may react further. The acid-combining capacity of exposed wool is 13 per cent approx. less than that of unexposed and is reflected by a reduced affinity for acid dyes. The affinity of the dye for the fiber and the fastness to washing of the resulting dyeing depend on the chemical constitution of the dye, the degree of aggregation in solution, the increased swelling capacity of the wool and the chemical changes which occur on exposure. The good fastness to washing of Neolan dyes on exposed wool is attributed to the effect of the chromium in the dye molecule on the fiber-dye linkage. The degree of exhaustion of equalizing acid dyes on exposed and unexposed wool is the same in the presence of sulfuric acid, but with acetic acid the exposed material is dyed more deeply.

THE DYEING OF COTTON WITH MINERAL KHAKI: PART V—AN EXAMINATION OF THE FACTORS WHICH GOVERN VARIATIONS IN THE CHROMIUM AND IRON CONTENTS OF YARNS DYED BY THE MINERAL KHAKI PROCESS, E. Race, F. M. Rowe and J. B. Speakman, *Journal of the Society of Dyers and Colourists*, page 224, No. 9, Vol. 61, September, 1945.

Part I appeared in the *Journal of Dyers and Colourists*, 1941, *57*, 213, Part II, 1941, *57*, 257, Part III, 1942, *58*, 32 and Part IV, 1942, *58*, 161.

The authors summarize Part V as follows:

Analysis of two batches (designated Batches 25 and 35) of cotton yarn dyed with mineral khaki according to large-scale practice indicates that the variations in chromium and iron content of yarn taken from the same batch are considerable. For example, in Batch 25, the total oxide content (calc. as percentage on the weight of the yarn) varied between 1.74 per cent and 2.56 per cent, with an aver-

age of 2.15 per cent, and in Batch 35, the total oxide content varied between 2.36 per cent and 3.38 per cent, with an average of 2.80 per cent. These variations appear to be due mainly to differences in the amounts of chrome-iron liquor retained by the yarn during impregnation, which in turn are determined by the pressures applied to the yarn during the hand-wringing process.

Development of the chrome-iron impregnated yarn was carried out in a standing bath composed of a mixture of sodium hydroxide and sodium carbonate, and, at the rate of replenishment employed, the concentrations of both sodium hydroxide and sodium carbonate in the alkali developing bath becomes progressively greater as the processing of each batch continued. However, whilst in Batch 25 the concentration of sodium hydroxide increased by only 45 per cent approx. of its initial value during the processing of 400 lb. yarn that of sodium carbonate increased by nearly 600 per cent during the same period, indicating that, in mixtures of sodium hydroxide and sodium carbonate, the latter does not function as a precipitant for iron and chromium when there is an excess of sodium hydroxide present, but mainly functions as a solvent for alkali-soluble chromium and as an increasingly effective scouring agent of the yarn.

From the analysis of yarn processed in the laboratory, it is clear that, in the case of both sodium hydroxide and sodium carbonate development, an increase in the concentration of the alkali developing liquor leads to a decrease in the alkali-soluble chromium content of yarn, since excess alkali in the developing bath functions as a partial solvent for the alkali-soluble chromium. On the other hand, increase in alkali concentration in the developing bath results in an increase in both the iron and the chromium contents of the yarn, since, at the lower concentrations of alkali, precipitation of the oxides is slower and there is a greater possibility of chromium and iron salts present in solution in the yarn passing into the developing liquor and subsequently being precipitated in the developing bath rather than on the fiber.

When yarn impregnated with chrome-iron liquor is developed in mixtures of sodium hydroxide and sodium carbonate, at low concentrations (e.g. 6 milliequivalents of alkali per 10 g. yarn), the chromium content of the pigment is independent of the ratio of sodium hydroxide to sodium carbonate, whilst at higher concentrations (e.g. 24 or 48 milliequivalents of alkali per 10 g. yarn), the chromium content of the yarn decreases as the proportion of sodium carbonate in the developing liquor increases. On the other hand, at all concentrations of alkali, the amount of iron retained by the yarn increases as the proportion of sodium carbonate in the developing liquor increases. These results are explained by the fact that iron oxide is precipitated from solution at a lower pH value than chromium oxide; also, it is believed that iron possesses a greater affinity for cellulose than chromium. Therefore in developing liquors containing progressively increasing proportions of sodium carbonate, iron oxide tends more and more to be preferentially precipitated on the yarn, whilst the chromium salt in solution on the yarn, being precipitated more slowly, tends to pass into the developing liquor and to be precipitated there instead of on the fiber.

It is evident that, as far as production of chromium and iron pigments on the fiber is concerned, nothing is gained by the use of mixtures of sodium hydroxide and sodium carbonate as developing agents. The use of sodium carbonate alone is to be preferred to the use of sodium hydroxide alone for the following reasons:

(1) Small changes in concentration of sodium carbonate in the developing bath result in smaller differences in the total amount of mixed oxides fixed on the yarn than similar changes in concentration of sodium hydroxide in the developing bath.

(2) Sodium hydroxide is liable to be converted into sodium carbonate during its use as developing agent; therefore, as development in a standing bath of "sodium hydroxide" proceeds, the yarn will in reality be developed in mixtures of sodium hydroxide and sodium carbonate.

(3) By using sodium hydroxide as developing agent, the yarn is liable to be alkaline to both phenophthalein and Methyl Orange, whereas by using sodium carbonate alone as developing agent, the yarn is less liable to be alkaline to phenophthalein, although it is still liable to retain alkalinity to Methyl Orange. Consequently, the use of sodium carbonate alone is more likely to lead to conformity with a specification which requires the yarn to possess no alkalinity to phenophthalein, whilst allowing alkalinity to Methyl Orange.

Since variations in the total oxide content of the yarn are dependent not only on variations in the amount of chrome-iron liquor retained by the yarn after impregnation, but also on variations in concentration of the alkali developing liquor, it is possible that careful chemical control of the developing liquor (which is simplified by the use of sodium carbonate alone rather than a mixture of sodium carbonate and sodium hydroxide) may rectify the comparatively large variations in oxide content of the yarn caused by unequal pressures applied during hand-wringing.

THE DYEING OF COTTON WITH MINERAL KHAKI: PART VI — A METHOD OF LIMITING THE VARIATIONS IN OXIDE CONTENT OF MINERAL KHAKI-DYED YARN BY CHEMICAL CONTROL OF THE DEVELOPING BATH, E. Race, F. M. Rowe and J. B. Speakman, *Journal of the Society of Dyers and Colourists*, page 233, No. 9, Vol. 61, September, 1945.

The authors' summary follows:

By the use of low concentrations of sodium carbonate alone as developing agent in dyeing cotton with mineral khaki, and by careful chemical control of the standing sodium carbonate developing bath, it is possible to overcome variations in the total oxide content of the material caused by variations in the amount of liquor retained by the fiber due to unequal wringing pressures after impregnation in the chrome-iron solution. If in replenishing the developing liquor, smaller additions of sodium carbonate are made than are required in order to renew that neutralized during the previous developments, the progressively decreasing concentration of sodium carbonate in the developing bath results in a progressive decrease in the amount of oxides retained by the yarn, even though during each individual development there is an excess of sodium carbonate over that required completely to precipitate the chromium and iron on the fiber. Conversely, additions of sodium carbonate greater than are required to renew that neutralized during the previous developments result in a progressive increase in the amount of oxide retained by the fiber. When the concentration of developing liquor is maintained constant, however, the chromium, iron and alkali-soluble chromium contents of the yarn are also constant.

The use of a concentration of sodium carbonate in the developing bath not greatly in excess of the stoichiometric amount required for complete precipitation of chromium and iron held by the impregnated yarn, together with the maintenance of this concentration by controlled additions of sodium carbonate, leads to the production of a mineral khaki-dyed material which does not require subsequent washing or treatment in mildly acid solution, provided that the final wash treatment is carried out in a slightly acid medium.

SYNTHETIC PROTEIN FIBERS FROM PROTEIN-DETERGENT COMPLEXES, Harold P. Lundgren, *Textile Research Journal*, page 335, Vol. XV, No. 10, October, 1945.

This paper was read at the Gibson Island Conference on Textiles of the American Association for the Advancement of Science on July 12th, 1944. The

author is with the Western Regional Research Laboratory at Albany, Calif. He summarizes his paper as follows:

In this discussion the use of hydrocarbon salts in the preparation of spinning dispersions from corpuscular as well as fibrous proteins has been described. Egg white and chicken-feather keratin have been used as typical proteins. By appropriate stretching along with the removal of detergent, highly oriented fibers having the β-keratin structure typical of natural protein fibers have been made.

With crystalline egg albumin as a model protein, it has been shown that primary interaction between proteins and long-chain hydrocarbon salts is electrostatic, involving the basic groups of the protein when anionic detergents are used. Additional detergent can be bound, presumably by the residues of the detergent bound electrostatically and by non-polar forces. When additional detergent is bound, the complex acquires flow properties that are necessary in the fibermaking process.

Research—

(Concluded from Page 515)

of deterioration occurred and how it could be minimized. By careful selection of finishing plants and continual control testing of their product it was possible to increase the storage life in impregnated clothing so that there was a reasonable assurance that the clothing would have adequate life expectancy when needed for protection against gas attack. While gas warfare was not actually used in this war, we had to be prepared for it. Possibly in a future emergency we will have to be prepared with clothing which will protect the soldier against other new forms of attack.

Another important field of research has been the development of clothing for protection against flash burns, particularly to protect personnel in tanks. A process for obtaining an excellent durable flame-resistant treatment on clothing was developed and was just getting into production at the end of the war. It will undoubtedly have great applications in the post-war world.

It would be quite impossible in the brief time we have here today to attempt to cover all of the other fields of textile research in which the Quartermaster Corps has a definite interest. Some of them present special phases of the problems already discussed while others constitute distinct problems of their own. Those already outlined, however, comprise the major fields in which the continuance of extensive fundamental research is considered vital to the accomplishment of the mission of the Quartermaster Corps.

Much has been said as to what the textile industry has learned from the war. It is true that it has learned how to make new fabrics and how to control quality beyond anything known before the war. I should like to suggest that from our standpoint there have been two major contributions.

First in attempting to make the kind of fabrics the Army needs to clothe and shelter men properly in all kinds of climates, we have demonstrated on a scale of unprecedented magnitude the value of well-planned fundamental research, coordinated with efficiently executed applied research and development. Such a compelling picture of the value of textile research did not exist in the industry before the war.

Second, our research program has of necessity directed attention to the study of the physical properties of textile fibers and fabrics and the fundamental laws governing their performance under many different conditions. In this field, which is peculiarly the responsibility of the textile industry, there has not heretofore been the contribution to scientific knowledge which has been made by the related chemical industries in the chemistry of textiles.

It is our belief that the demonstration of the value of research and the area in which research is most needed today will serve to promote and stimulate study in this important and necessary phase of textiles. By so doing we believe that we have contributed towards improving the living standards of the American people as well as insuring the availability for future emergencies of adequate technical development within the textile industry for coping with the problems of clothing armies in time of war.

TRADE NOTES • NEW PRODUCTS

• JOINS QUAKER

Quaker Chemical Products Corporation, Conshohocken, Penna., announces that James Bosworth Irvine has joined their staff of research chemists. Mr. Irvine received his B.S. in Industrial Chemistry from the University of Kentucky in 1937 and has since been engaged in analytical and research work in the laboratories of The Hercules Powder Co., The O. F. Zurn Co. and Collins and Aikman Corp. For the past eight years he has specialized in the development, manufacture and application of textile chemicals. Mr. Irvine is a member of the A.A.T.C.C. and the American Chemical Society.

• JOINS TEXTRON

Carl C. Mattmann, Jr., for 30 years in the textile industry, has been appointed Director of the Fabric Development Department of Textron, Inc. For the past 15 years Mr. Mattmann has been Manager of the Fabric Development Department of the A. M. Tenney Associates, Inc.

His appointment with Textron, Inc., for which he will be director of the development of new fabrics, becomes effective December 1. His office will be in the Empire State Building.

• PHI PSI MEETING

The Philadelphia Alumni Chapter of Phi Psi Fraternity held its first Fall meeting at the River Drive Terrace in Philadelphia on Thursday, October 25. The guests included the members of Alpha Chapter, Phi Psi Fraternity, Dean Richard S. Cox, Philadelphia Textile Institute; Dean H. Koons, Bradford-Durfee Textile School, New Bedford, Mass.; Harold Hart and Harold Wood of Grand Council of Phi Psi and Alben Eavanson of the Philadelphia Textile Institute Foundation Fund.

The program was planned by Robert A. Smith. The principal speaker of the evening was Mr. H. Wickcliff Rose, Coordinator of Research and Planning of American Viscose Corp., whose topic was "Research in Textiles." This was followed by an American Viscose Corp. movie entitled "A New Frontier of Progress." Thomas H. Hart of Hart Products Corp., president of the Alumni group, conducted the meeting, which was well attended.

• TO SPEAK TO ALUMNI

Dr. Harold DeWitt Smith, treasurer of A. M. Tenney Associates, Inc., will be the principal speaker at the first dinner of the Alumni Association of the Philadelphia Textile Institute to be held in the New York area, it was announced recently by Carl C. Mattmann, Jr., President of the Alumni Association. The dinner will be held at the Hotel Roosevelt, New York, Friday, December 14.

Charles W. Carvin, vice-president of the Industrial Rayon Corporation, and a graduate of the Philadelphia Textile Institute, will act as toastmaster.

Fred M. Rapp, of Pacific Mills, is chairman of the dinner committee.

● JOINS INTERCHEMICAL

Albert J. Keenan has joined the Trade Sales Division of Interchemical Corporation as assistant sales manager. Mr. Keenan was formerly in the Wilmington, Delaware office of E. I. du Pont de Nemours & Company, where as assistant supervisor of stores he handled the purchasing and merchandising of sundries.

● RETURNS TO BUTTERWOTH

Colonel J. Ebert Butterworth returned to duty with H. W. Butterworth & Sons Company on November 5th after four and a half years of Army service.

He served in North Africa and in Italy. At the time of his discharge, he was Chief of the Economics & Supply Division of the G-5 Section (Civil Affairs), Allied Force Headquarters, Mediterranean Theatre of Operations.

J. Ebert Butterworth

In March, 1945, he was made an Officer of the Most Excellent Order of the British Empire (Honorary) and in September, 1945, was awarded the Legion of Merit for his work in formulating and carrying out the civilian supply program in the Mediterranean Theatre of Operations, which in turn enabled the military commanders to devote themselves to the military operations without occasion for concern as to unrest of the civil population in the rear area.

Colonel Butterworth was a veteran of World War I and was wounded in action at Montfaucon while in command of Company F of the 313th Infantry. He was a member of the Officers Reserve Corps when called to active duty in June, 1941.

Colonel Butterworth graduated from Princeton in the class of 1916. He played varsity basketball and football and was a member of the Tower Club.

Colonel Butterworth will play an important role in the post-war plans of H. W. Butterworth & Sons Company.

● REJOINS NOVA CHEMICAL

Nova Chemical Corporation with main office at 153 Waverly Place, New York, N. Y., announces that Capt. J. Lindsay Wyman has rejoined their staff as Southern representative for the states of South Carolina, Georgia, and Alabama. He will make his headquarters at Augusta, Georgia. Capt. Wyman has recently completed service with the United States Army Chemical Warfare Service.

● JEFFERSON CHEMICAL APPOINTMENT

Appointment of Wm. H. Bowman as Market Development Manager of Jefferson Chemical Company, Inc., has been announced by P. M. Dinkins, Vice President and General Manager of Jefferson. Dr. Bowman will be responsible for organizing market research, market development and sales and technical service facilities. Before joining Jefferson he was Manager of the Technical Service & Market Development Division of Westvaco Chlorine Products Corporation, and prior to that he held research and development posts with Shawinigin Chemicals Ltd., and Armstrong Cork Company. Dr. Bowman has also served as a member of the chemical engineering and chemistry faculties of the University of Toronto, New York University, and the Case School of Applied Science. At the present time he is on the Executive Committee of both The Chemical Market Research Association and the Technical Service Group of the Chemical Industry.

Jefferson Chemical Company, jointly owned by American Cyanamid Company and The Texas Company, is building a plant at Port Neches, Texas, where it will make intermediate chemicals for the manufacture of synthetic rubber, plastics, extiles, and other materials, from petroleum and petroleum gases.

● DU PONT APPOINTMENT

Maurice du Pont Lee, manager of the Rayon Technical Division since 1932 and a pioneer in the development of Du Pont's interests in dyes and synthetic fibers, has been named general consultant in the Engineering Department, it was announced recently by E. I. du Pont de Nemours & Company.

Graduated from Cornell in 1908 with a degree in mechanical engineering, Mr. Lee was employed by the Du Pont Company on September 1 that year and worked as an assistant purchasing agent until July 1, 1910, when he was assigned to the Engineering Department.

Prior to World War I and immediately thereafter, Mr. Lee traveled extensively in Europe studying dyes and synthetic fibers. He was in charge of the design and construction of the company's first dye plant at Deepwater Point, N. J.

With the formation in 1920 of the Du Pont Fibersilk Company, initial forerunner of the present Rayon Department, Mr. Lee became production manager of the first plant at Buffalo, N. Y. Three years later, when the Du Pont Cellophane Company was formed, he was named production manager and secretary. In 1925, when the Fibersilk Company became the Du Pont Rayon Company, he was made vice-president and secretary of that corporation and the companion Cellophane Company.

● TENNESSEE EASTMAN EXPANSION

Announcement was made recently that the work of expanding the production of Tennessee Eastman Corporation, Kingsport, Tennessee, now under way, will call for the expenditure of more than $5,000,000 during each of the years 1946 and 1947.

James C. White, President of Tennessee Eastman, states that operation of three buildings is scheduled to begin by July 1, 1946. One of these, a six-story steel, brick and concrete building, 200 feet square, will produce cellulose esters. Another steel and concrete building, two stories high and 150—500 feet, will produce acetate yarn and a third building of the same size will produce acetate staple.

Completion of the present work is expected to result in an increase of 30 per cent in capacity for yarn and staple by the end of 1946 and a corresponding increase in the production of Tenite, the company's cellulose ester plastic, and the addition during the next two years of about 2,000 employees. The number now employed is about 7,000.

The buildings now under construction and others to be constructed next year are the authorized part of an overall plan which, if carried out, will further increase the company's capacity to produce acetate yarn and staple by more than ten per cent during each of the three years following 1946.

● EXPAND LABORATORIES

Milton Harris Associates recently have acquired an additional 3000 square feet of floor space at their present location, 1246 Taylor St., N. W., Washington, D. C. The space has been used for the expansion of the chemical laboratories and for the addition of small scale equipment for experimental work on dyeing, finishing, laundering and weathering. Enlargement of the laboratory also will provide more office space for the increased staff, and will allow for expansion of the technical library.

The Harris Associates laboratories now occupy about 7000 square feet of floor space. The organization employs a staff of 30 chemists, physicists and engineers, and is equipped to conduct research and development on the physical, chemical, and biological properties of textiles and

From left to right: Edwin R. Barlett, President of Hooker Electrochemical Co.; Colonel Kenneth D. Nichols, District Engineer of the Manhattan Project; Brigadier General Thomas E. Farrell, Assistant to General Groves; Major General Leslie R. Groves, Chief of the Manhattan District Project; Harry M. Hooker, Chairman of the Board of the Hooker Electrochemical Company; Commodore William S. Parsons, Naval Ordnance expert who flew in the B-29 which dropped the first atomic bomb on Hiroshima; John W. Burden, President of the Niagara Hooker Employees' Union; Dominick Justiana, a member of the union's executive committee.

• SPECIAL AWARD TO HOOKER

In impressive ceremonies at the Hooker Electrochemical Co., Niagara Falls, N. Y., on October 2, Major General Leslie R. Groves, Commanding General, Manhattan Project, made the presenation of the Special Award Army-Navy E Flag with 3 stars to the employees of the company for their record in the production of material for the atomic bomb. Present were employees of the company and their families.

Due to the secrecy involved, this award, the second made by the Government for workers on this project, paid tribute to the Hooker Electrochemical Co. for sustained performance that not only met government requirements but in many cases bettered estimates during a three-year period. Edwin R. Bartlett, President of Hooker Electrochemical Co., accepted the award on behalf of the company.

Commodore Wm. S. Parsons, Navy Ordnance expert, who was one of the weaponeers aboard the B-29 Super Fortress which dropped the first atomic bomb on Hiroshima, presented the Army-Navy E Pins to the employees. Acceptance was by John W. Burden, President of Hooker Employees Union.

In connection with the ceremonies an exhibit was set up at the plant which showed graphically the basic fundamentals of atomic structure, the conversion of mass to energy and an explanation of the tremendous explosive power of the bomb. Photographs of Hiroshima and of the test site in New Mexico as well as a sample of the glass-like material that was formed from the desert sand by the explosion at the trial site were also displayed.

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elated products. Current investigations include extensive work in the field of textile finishing, such as shrink-resistant, water-repellent, fire-resistant, and mildew-resistant finishing processes; functional properties of fibers, fabrics, and clothing; cellulose and protein chemistry; chemistry of starch and starch sizing; synthesis of organic chemicals; detergents and detergency; and synthetic resins. In addition, the organization maintains a technical library and cooperates in the publication of the abstract service, "Natural and Synthetic Fibers."

• FABRIC EXPOSITION

The Textile Association of Los Angeles, in their meeting held recently at the Los Angeles Chamber of Commerce, unanimously voted to sponsor a fabric exposition, to be held in Los Angeles in the Fall of 1946. The Exposition is to be called—"Fabrics of the Future."

The program is timed to permit the fabric, the yarn, and the finishing producers of the country an opportunity of presenting to the people of America those products which have been withheld from the public, due to war conditions. All products of yarn and fabric manufacturers, as well as all fabric finishers throughout the nation will be invited to present a display of their products.

The educational value of such displays will be stressed, as well as the commercial and consumer qualifications. Textile displays will embrace all fields of apparel, household, and decorative fabrics. Fabric end use will be exploited in a romantic and colorful California manner.

The Board of Directors of the Textile Association of Los Angeles was authorized to appoint a committee to immediately start the development of the Exposition. It is planned that it will be staged in the largest available quarters and that it will be of a ten-day to two-week duration and will be made of national value and importance.

• DU PONT STATEMENT

E. I. du Pont de Nemours & Co. on November 15th issued the following statement:

Recurring reports from Germany giving the impression that the Du Pont Company is a substantial stockholder in I. G. Farbenindustrie are entirely incorrect. The Du Pont Company has no investment whatever in I. G., or any of its subsidiaries.

The latest of these reports is a statement attributed to Colonel Edwin S. Pillbury, identified as Farben Industry control officer in Germany.

The only stock interest Du Pont ever had in I. G. Farben, in fact, came as a result of an investment of $1,785,522 made in 1925 in the stock of two German explosives firms, Dynamit A. G. and Koln-Rottweil, which later were merged with or came under the control of I. G. The Koln-Rottweil shares were converted into I. G. shares. The investment was later increased, by the exercise of purchase rights, to a total of $2,395,316, which was approximately one-half of one per cent of the issued shares of that company.

Du Pont began disposing of its investments in I. G. in 1933. Sale of its whole remaining I. G. investment was authorized by Du Pont in 1934. This proved difficult because of currency regulations and blocked mark requirements. The I. G. stock was, however, fully disposed of in 1940, at a loss of $671,406, and the Dynamit A. G. shares, sold at the same time, were liquidated at a loss of $534,359.

• JOINS ORGANIC CHEMICAL

Boleck L. Lizak has been appointed Technical Director of Sales of the Organic Chemical Co., manufacturers of chemical specialties for the textile trade, with offices and plant in Providence, R. I. In addition to his sales duties, Mr. Lizak will assist in the research and development of new textile products in the Organic Laboratories.

Mr. Lizak was associated with the Morgan Dyeing & Bleaching Co., Rochelle, Illinois, as Chief Chemist of their experimental laboratories for two years.

In 1942 he was appointed to the posi-

tion of Chemist of the Marine Corps, Depot of Supplies, Philadelphia, Pa., and in 1943 received a commission in that branch of the Service. He was discharged from the Marine Corps as 1st Lieut., October 1, 1945.

• CALCO'S FUTURE PLANS

S. C. Moody, General Manager of the Calco Chemical Division, of the American Cyanamid Company, speaking on his company's post-war aims and future planning, announced recently that ground had been broken for the first units of the new Research and Technical Sales Service Center, at Bound Brook, New Jersey.

The Center, when completed, will also include the General Administration offices of the company.

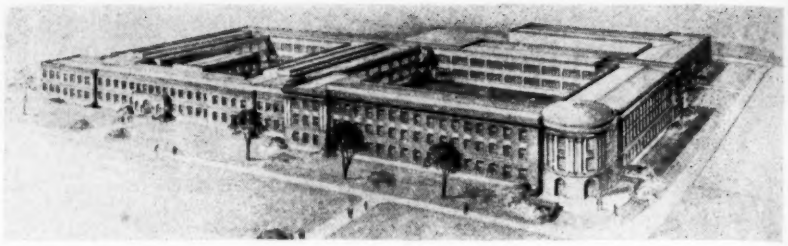
Present plans call for the immediate erection of the application and technical sales service laboratory units, according to J. H. McMurray, Calco Director of Engineering. The foundation for this structure will be laid at once and the unit completed and ready for occupancy by early Summer 1946. This unit will become the new quarters for the pigment, paper and textile resin sections of the application laboratory and the technical sales offices for this group.

In order to provide adequate facilities for the rapidly expanding Physics and Physical Chemical Departments, construction of the east wing of the research section will be included in the first stage of the building program, and will ultimately become a part of the general research unit. At a later date it is proposed to erect the organic research section which will be a duplicate in size and layout of the physics building.

When completed the new Research and Technical Sales Service Center will house, according to Mr. Moody, all of the research and sales application laboratories now located throughout the Bound Brook plant and at the Pigment Department, Newark, New Jersey. Provision has also been made for a cafeteria, library and an auditorium designed to seat approximately 300 persons.

The entire group of buildings will cover an area of approximately six acres.

As a part of the new expansion program instituted by Calco, a new manufacturing building is being erected within the plant proper to house the Organic Pigment Manufacturing Department, now located at Newark, New Jersey. The Inorganic Pigment Department, also located at Newark, will be relocated at the new Willow Island, West Virginia plant, on which construction has already started. The transfer of operation and plant personnel from Newark must be completed by the end of 1946, since the Newark plant has been sold and must be vacated. Mr. Moody, commenting on Calco's future, states "In this age of chemistry, we will not maintain for long our present position without a faithful and constant search for new products, improved products and methods of production."



NEW HOME FOR RESEARCH—The visual plan of the new Calco Research and Technical Sales Service Center, at Bound Brook, New Jersey. F. Y. Joannes, of New York, is the supervising architect. These buildings, all of a modernized Georgian type of architecture, are part of an expansion program already begun that will provide facilities for the manufacture of new products and insure continued progress in research and technical service to the customers of Calco.

Dr. M. L. Crossley, Calco Director of Research, points out that research has to fulfill four functions in industry:—

First:—It must establish fundamental data essential to the understanding of specific problems and guide in their solution.

Second:—It must create new products and things that will assure new earning power for the industry and provide the means for social and economic progress.

Third:—It must maintain the quality and efficiency of the products and the services they render in order to safeguard the existing investment in the industries.

Fourth:—It must furnish the basis for the production of the variety of types of products needed to maintain the essential structure of a free competitive system of economy.

The new dyes, of greatly impoved fastness, new life saving sulfa drugs and new melamine resins to control shrinkage of woolen fabrics, to name but a few of the new Calco products, have all been the result of research. The consumers of these products are the chief beneficiaries of the research involved in making them available.

The Calco plant, at Bound Brook, New Jersey, was begun in 1915 and during World War I became an important producer of coal tar intermediates. Following the war, the Calco Chemical Company, as it was then known, entered the new field of dyestuffs manufacture. The company continued rapidly to expand and in 1928 was acquired by the American Cyanamid Company.

Today, the Calco Chemical plant at Bound Brook, covers an area of approximately 500 acres. Here is produced a long list of dyes, drugs, textile resins, rubber chemicals, inermediates and plastics.

Calco also operates two plants at Newark, New Jersey; one occupied by the Heller & Merz Division, manufacturing dyes for the paper industry; and the second plant operated by the Lake & Pigment Department, producers of dyes and pigments for the linoleum, printing ink, paint and varnish industries.

Calco is a producer of Titanium Dioxide, an important white pigment used in the paint and paper industries, with plants at Piney River, Virginia, and Gloucester City, New Jersey.

Early this year, Calco announced the purchase of 800 acres of land at Willow Island, near Parkersburg, West Virginia, on which construction of a new plant has already been started. When completed this plant will provide a location for the manufacture of new products developed in the research laboratories of the Cyanamid organization as well as by Calco's own research group. The Willow Island plant should be ready for initial production by the end of 1946, according to Mr. Moody.

• NATIONAL ADHESIVES' MEETING

R. M. L. Francis, Managing Director of National Adhesives Ltd., Slough, England, and recently, Flight Commander in the R. A. F., has arrived in New York on his first visit to this country since prewar days.

National Adhesives' English plant has been engaged exclusively in the production of materials essential to the prosecution of the war, and is now better than ever prepared to serve peactime industry.

O be Meijer, Managing Director of Nationale Zetmeelindustrie, N.V., Veendam, Holland, has also reached the New York headquarters of National Starch Products Inc., and will attend a meeting of all the managers of foreign plants, including those of Meredith Simmons & Co. Ltd., Toronto and Montreal, Canada. Peacetime manufacturing and marketing problems are to be discussed.

National's Holland Plant manufactures potato starches and dextrines as well as industrial adhesives. Production has been resumed and an expanded volume—particularly in food starches sorely needed by the Dutch people, is anticipated.

Announcement has also been made of a general meeting for all domestic plants and offices to be held in New York City next December 14, 15 and 16, when plans formulated during the war will be explained and put into operation.

• HEYDEN APPOINTMENT

The Heyden Chemical Corporation has announced the appointment of N. P. Malin as Manager of the Far Eastern Sales Department.

Mr. Malin was formerly the Export Manager of Marshall Dill in San Francisco, California. He is well-known in the Far Eastern chemical trade and has traveled extensively in China, Japan, Philippines and the East Indies.

Mr. Malin is located in the general office of the company at 393 Seventh Avenue, New York 1, N. Y.

• TRANSFER QUARTERMASTER ACTIVITIES

The transfer of Quartermaster activities pertaining to the administration of textile and clothing contracts recently noted another step in the expansion of the centralized Army-Navy Purchasing Offices at 111 East 16th Street.

The move involved the transfer of 50 military and civilian specialists from the Philadelphia Quartermaster Depot. This staff will take care of the administration of all contracts awarded by the three consolidated Quartermaster commodity sections here: Textiles, Clothing, Knit and Women's Wear. The Quartermaster Legal Branch has also been expanded to assume all claims and appeals now outstanding and to provide supplemental agreements and other legal work, as has the Quartermaster Cost and Price Analysis Branch.

The only purchasing activity remaining at the Philadelphia Quartermaster Depot is the purchase of miscellaneous items such as insignia, ornaments, chevrons and medals.

• JOHN MILTON HARRIS

Among the recent additions to the staff of Milton Harris Associates, Washington, D. C., are the following:

Dr. Anthony M. Schwartz, formerly Director of Research for Alrose Chemical Co., and prior to that with Visking Corp. and National Aniline Division of Allied Chemical & Dye Corp. Dr. Schwartz will conduct work in the field of organic synthesis.

Dr. Alfred E. Brown, who has been on leave from the Protein Division of the Eastern Regional Research Laboratory to the Joint Army-Navy NDRC Tropical Deterioration Project at George Washington University where he served as Research Associate.

Anthony M. Schwartz

Daniel Frishman, recently released from the Manhattan Project, Oak Ridge, Tenn., and formerly a Research Associate of the Textile Foundation at the National Bureau of Standards. He will conduct work on wool chemistry and related problems.

Byrell W. Bullock, who, during the war, was associated with the Applied Physics Laboratory at Johns Hopkins University, doing work on the proximity fuse. He will do development work on electronic devices and specialized equipment for textile research.

• JOINS INTERCHEMICAL

Interchemical Corporation Export Division has announced the appointment of William M. E. Geering as its representative in India and Ceylon. According to C. A. Richards, Director of the division, Mr. Geering's appointment is part of the company's program of expansion in export markets.

William M. E. Geering

Mr. Geering, who was born in Switzerland and is a graduate Chemical Engineer, has been associated for the last five years with one of the largest chemical companies in India. He will return to that country after completing a study of Interchemical products here.

• S.C.I. OFFICERS

The American Section of the Society of Chemical Industry announces the election of Francis J. Curtis, Vice President of Monsanto Chemical Company, as Chairman and Sidney D. Kirkpatrick, Editor of *Chemical & Metallurgical Engineering*, as Vice Chairman, to serve until July 1946.

Cyril S. Kimball and J. W. H. Randall were reelected Honorary Secretary and Honorary Treasurer, respectively. The following were elected as new members of the Executive Committee: W. J. Baeza, G. J. Esselen, C. N. Frey, R. Heggie and N. A. Shepard. R. Heggie will serve as Assistant Honorary Secretary and W. J. Baeza as Assistant Honorary Treasurer.

• NEW REICHHOLD PLANTS

Following the first postwar Board of Directors meeting of Reichhold Chemicals, Inc., Henry H. Reichhold, the founder, owner and Chairman of the Board, announced that plans have been completed and the necessary funds appropriated for the erection of three new manufacturing plants for the production of chemical color pigments.

The present plant and offices of the chemical color division of RCI are located in Brooklyn, New York, which will continue to be headquarters for that division. Sites for the three new plants have been selected in Detroit, San Francisco and Tuscaloosa, Alabama.

In setting forth on this first major postwar expansion program, the company has three objectives, Mr. Reichhold stated. First, additional facilities to meet the greatly increased demand for bright and cheerful colors, which will come from a nation that is weary of four years of gray and olive drab, the traditional shades of war. Second, the production of chemical color pigments in each of the four major sections of the country, north, south, east and west, in order to provide the best possible service in each district. Third, the increasing of production facilities to implement the nation's full employment program and thereby contribute to said program in each of the four major industrial areas.

In line with the company's general policy to control certain raw materials strategic to its processes, a policy which in recent years has affected the construction of plants for the production of phenol, phthalic anhydride, plasticizers, refined glycerine and oils, upon which materials are based important classes of synthetic resins, the present expansion program calls for the manufacture of chromium chemicals and certain organic chemical intermediates and dyestuffs in the plant which is to be situated at Tuscaloosa, Alabama. Thus, in addition to its function as a producer of finished products, the southern plant will serve the other three units with basic raw materials for

the manufacture of chrome yellows, chrome greens, zinc chromate and organic lakes and toners.

• INCREASED NITROCELLULOSE PRODUCTION

Hercules Powder Company recently announced plans for increasing production of soluble nitrocellulose 1,000,000 pounds monthly at the company's Parlin, New Jersey, plant.

This expansion will be accomplished through the use of equipment used in military production at the Parlin plant, with the addition of new dehydration and distillation apparatus, according to E. G. Crum, superintendent of the plant.

Work on the conversion is being rushed to completion, Mr. Crum said, and it was expected a part of the new installation would be ready for production early in October.

The company's plant expansion is necessitated by increased demands for Hercules' soluble nitrocellulose, which is the base for quick drying lacquers, nitrocellulose plastics, coated textiles, and other uses.

• MANAGER, ZION LACE

The appointment of R. H. Tuttle as manager of the Zion Lace Curtain Mill in Zion, Ill., is announced by Luther H. Hodges, vice president of Marshall Field & Company and general manager of the Manufacturing Division. Mr. Tuttle takes over the management from Lee R. Fleming, who has resigned. Charles E. Sieloff continues as assistant manager at Zion.

R. H. Tuttle

Mr. Tuttle, a North Carolinian, has been associated with Marshall Field & Company Manufacturing Division since 1929. He joined the Manufacturing Division as a specialist in dyeing shortly after completing his studies in chemistry and dyeing in Clemson College. In 1933, he was made superintendent of Karastan Rug Mills and in 1942 was named Personnel Manager of the ten Marshall Field & Company Mills in North Carolina and Virginia.

• JOINS I.T.T.

Jack D. Towery has been appointed to the Textile Engineering staff of the Institute of Textile Technology. Mr. Towery received the B.S. degree in textile engineering from the Texas Technological College in June 1938. From 1942 to 1945 Mr. Towery was the textile engineer in charge of cotton-spinning

Jack D. Towery

and weaving research projects at the University of Texas. This work was sponsored originally by the Texas Cotton Research Committee and later jointly by the National Cotton Council and the Office of Production and Research Development of the War Production Board.

Mr. Towery is a registered professional engineer and a member of numerous professional societies including Phi Psi, the American Association of Textile Technologists, and the American Association of Textile Chemists and Colorists.

• JOINS CHEMICALS DEPT., QUAKER OATS

Edward A. Reineck has joined the technical sales staff of the Chemicals Department of The Quaker Oats Company, Chicago, Illinois. He will assist in the development of new applications for Furfural and its derivatives in the resins and plastics industry.

Mr. Reineck was graduated from Lawrence College, Appleton, Wisconsin, in 1936. He has been on the staff of The Institute of Paper Chemistry for the past nine years, engaged in research and application studies of Furan and other resins as finishes, molding powder binders, laminating varnishes, and adhesives.

• AMERICAN VISCOSE EXPANSION

American Viscose Corporation has completed plans for an expansion program that will increase its rayon production by approximately 100,000,000 pounds a year, it was announced recently.

The main part of the program will be construction of a new plant at Radford, Va., which will produce approximately 55,000,000 pounds a year of viscose rayon staple. This product is used chiefly in spun rayon fabrics.

The remainder of the increased production will be obtained by enlarging the company's acetate rayon plant at Meadville Pa., and its viscose rayon staple plant at Nitro, W. Va.

At the present time American Viscose Corporation operates seven plants that are located at Marcus Hook, Lewiston and Meadville, Pa.; Front Royal and Roanoke, Va.; and Nitro and Parkersburg, W. Va.

Total current production of the company is at the rate of approximately 260,000,000 pounds annually.

• MONSANTO APPOINTMENTS

Appointment of S. U. Shorey as assistant manager, plasticizers and resins sales, and of B. B. Langton, as assistant manager, intermediate sales, has been announced by Robinson Ord, general sales manager of Monsanto Chemical Company's Organic Chemicals Division.

Mr. Shorey entered Monsanto's service in 1936 and for the past five years was sales representative for Phosphate and Organic Chemicals divisions' products at Everett, Mass. Mr. Langton started with Monsanto at Everett in 1940, and since last November has been in charge of the company's Washington office. Both will report to C. H. Somer, manager of plasticizers and intermediate sales, St. Louis.

• FRENCH TEXTILE PRODUCTION

Shipments of cotton and wool have been delivered to textile mills at Lille. So, although flax and hemp are still unavailable, the long-idle spindles of French cloth factories have again started to hum. From the scanty stockpiles of coal, 80,000 tons per month have been allotted to the mills.

The question of manpower is still an unsolved problem. In 1938, textile production provided 200,000 persons with full employment. At the beginning of 1945, only 65,000 were employed in the industry. Employers are faced with a lack of trained workers.

OBITUARY

NELSON A. FISHER

NELSON A. FISHER, Chicago and Mid-Western representative of Burkart-Schier Chemical Co., Chattanooga, Tennessee, died at his home on Sunday, November 4th, 1945.

Mr. Fisher was a member of the Mid-West Section of the American Association of Textile Chemists and Colorists.